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MORRIS ARBORETUM

MARCH 1975 BULLETIN 26 (1)

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THE MORRIS ARBORETUM BULLETIN

Volume 26 Number 1, March, 1975

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COVER: Cover of the *Neuer Hagerstauner Calender*, 1797, Hagerstown, Maryland. Reproduced courtesy of the Library Company of Philadelphia. Much of the literature used by the 18th Century American farmer was published in England. The *Neuer Hagerstauner Calender*, a kind of farmer's almanac, was one of the first native American agricultural publications. See article, page 8.

EDITOR: Hui-Lin Li ASSISTANT EDITOR: Susan B. Blum

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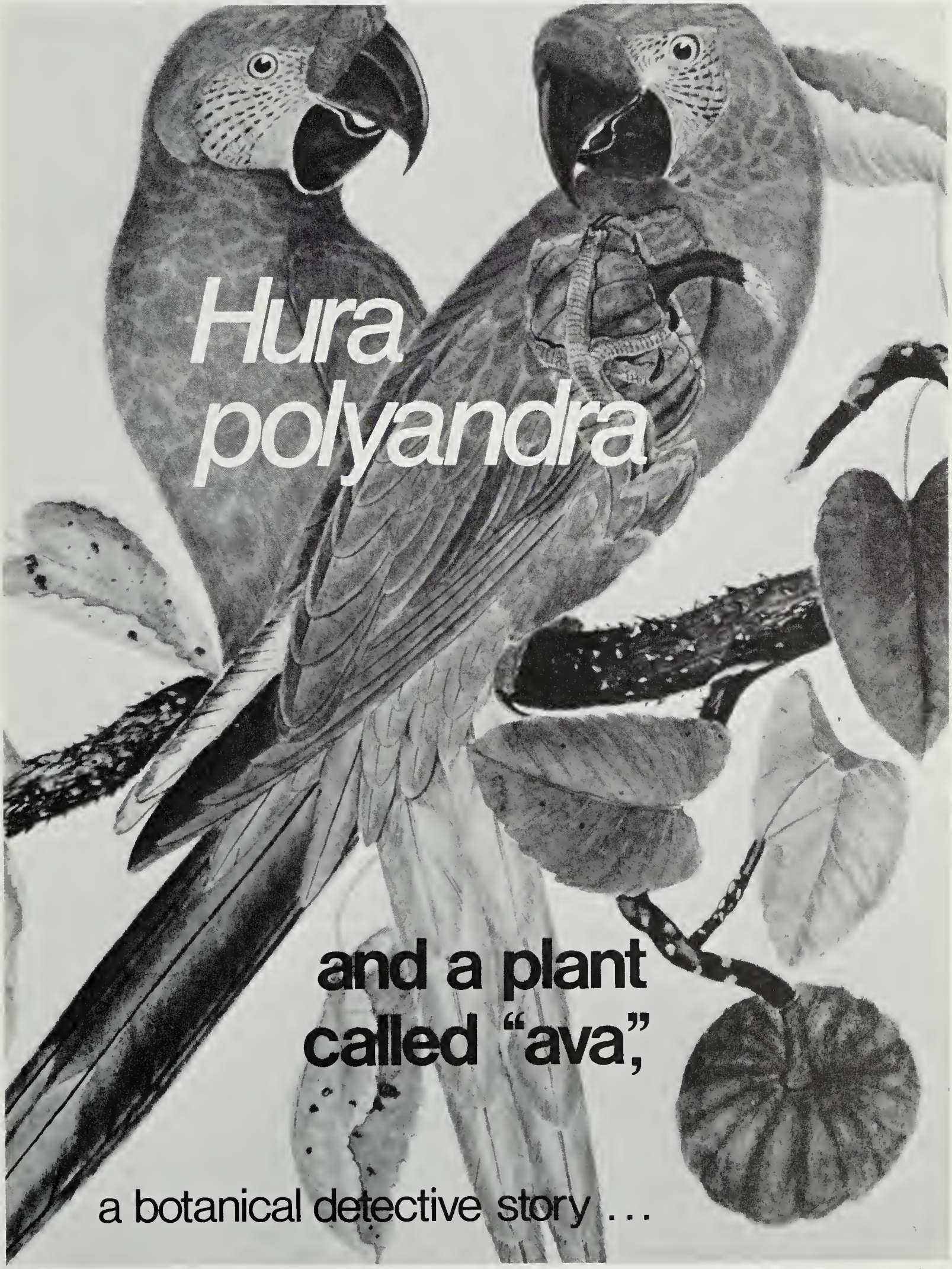

Plate by Andrew J. Grayson, 1865. Parrot species, *Ara militaris*; plant species, *Hura polyandra*. Reproduced courtesy of the Bancroft Library, University of California, Berkley.

Mrs. Ida K. Langman is the author of *A Selected Guide to the Literature on the Flowering Plants of Mexico*, 1964, a Morris Arboretum Monograph. The bibliography is an important tool for studies of the Mexican flora and received the Oberly Memorial Award from the Reference Services Division of the American Library Association, as the best bibliography in the field of agriculture or related sciences for 1963-1964. In December 1972, at the First Latin American Botanical Congress in Mexico City, the Botanical Society of Mexico awarded the work a gold medal. In this article, Mrs. Langman tells of solving one problem (among many that she encountered) in the preparation of this work. Although the episode is interesting in itself, it also gives the reader some insight into the complex and varied nature of preparing a comprehensive botanical bibliography.

. . . *Hura polyandra* and a plant called "ava"

by Ida K. Langman

This botanical detective story started with a reference in an article entitled "In the wilds of western Mexico." The author, Andrew Jackson Grayson, an ornithologist with strong interests in allied natural history fields, was recording his observations in the area around Mazatlan. Two plants attracted his attention: one was cited as *Ficus nymphaeaefolia*; the other was given a common name, "ava" and identified as *Upas strychnia*. Checking "ava" and *Upas strychnia* led immediately to some question marks. No "ava" was listed in Martinez' *Catalogo de nombres vulgares y cientificos de plantas mexicanas*, while the only clue that turned up in Willis' *A dictionary of the flowering plants and ferns* was a reference to an upas tree, *Antiaris toxicaria* Leach. The specific name, *toxicaria*, tallied satisfactorily with the fact that "ava" was used as a fish poison. But *Antiaris* is an eastern tree and had not ever been reported from Mexico.

It was clearly time to call on the experts and I turned to Professor Joseph A. Ewan, whose knowledge of the American naturalists is encyclopedic, and particularly strong for those in the United States. Did he, in any of his files on Grayson (and I was sure his files included material on Grayson), have references to this "ava" around Mazatlan?

Before long, his answer arrived. No, he knew of no "ava", nor of any reference to the plant by Grayson. However, he would write to Lois Stone in California, who was preparing a biography of Grayson and see if we could turn up any leads there. In the meantime, he had a fairly strong feeling that the "ava" was a *Rhus* but was not sure which one it would turn out to be. However, a check of Barkley's works on *Rhus* suggested that *Rhus* was not a possibility. Of the many species of *Rhus* described by Barkley, none was a fish poison and none was known commonly as "ava".

The next step in solving the puzzle came in word from Mrs. Stone that Grayson had indeed used the "ava" as the background for one of his bird illustrations and she would send a photocopy of the plate. At the same time, Joe had uncovered a short note on "Oopas or poison tree" by a Dr. Thomas Rorsfield in the *Analectic Magazine and Naval Chronicle* in 1816, abstracted from the *Transactions of the Literary and Philosophical Society of Java*, but this served as just an additional example of the interest that people had once had in this plant.

A month passed during which we waited for a photograph of "ava", while Joe was reaching the conclusion that our puzzling plant was probably *Rhus juglandifolia* (Barkley to the contrary, notwithstanding).

Well, the copy of the drawing finally came, and with it the end of the trail. Joe conjectured that the plant was *Hura crepitans* and so informed me. His diagnosis was almost right; the plant turned out to be a close relative, *Hura polyandra*. Back to my references to see what common names I had in the works that referred to *Hura*. The common name of *Hura polyandra* turned out to be "haba". Anyone who has ever read the rules for pronunciation of the Spanish "b", and then checked this against the actual pronunciation, will vouch for the fact that "haba" does indeed sound like "ava". Mr. Grayson probably never saw the plant name written out and so cited it phonetically as he heard it. Additional common names discovered for *Hura polyandra* fill in the picture very nicely. "Haba" becomes the diminutive form "habilla", or often "habilla de San Ignacio."

Did I hear anyone say that preparation of a bibliography is only compilation and does not include research?

Ref.: Grayson, Andrew J. In the wilds of western Mexico. *Overland Monthly* 7:331-337. 1871.

shrub profiles

ABELIOPHYLLUM DISTICHUM

by Elizabeth Derbyshire

Shrubs and trees in the Morris Arboretum are representatives of the north temperate region – in the Old World from Europe to the lower slopes of the Atlas Mountains in North Africa, from the Middle East to China and Korea.

Central Korea is the home of *Abeliophyllum distichum*, the Korean abelialeaf. This small deciduous shrub with delicate arching branches grows to three feet tall in most ordinary soils. Its small tubular flowers appear from late March to mid-April and are arranged in short, opposite racemes along the branches. The slightly fragrant, white to pinkish tinged blossoms show an orange center. Korean abelialeaf is sometimes called "white forsythia", though its flowers are much smaller and less numerous than those of forsythia.

The foliage of the Korean abelialeaf appears subsequent to its flowering. Leaves are elliptic in shape, oppositely arranged, from one to three inches long with some hairiness on both surfaces. The spherical fruit, winged around the margins, is about one inch across and suggestive of the elm fruit.

Abeliophyllum is a member of the Oleaceae or olive family. This is a group of widely distributed trees and shrubs, growing in tropical and temperate regions of both hemispheres. Many of its members are grown for ornament and shade and the family includes the edible olive.

The Arnold Arboretum, in 1924, was the first to receive seeds of *Abeliophyllum distichum*. The plant had been described in the *Botanical Magazine of Tokyo* in 1919, and Japanese botanist Takenoshi Nakai is given credit for naming the species.

Plants usually do best when grown in a situation similar to their native home. Korean abelialeaf likes sun, a moist, well-drained site, and a slightly acid soil. Although considered hardy in the Philadelphia area, the flower buds of abeliophyllum are sometimes affected by a late winter freeze. A protected planting site will help avoid the likelihood of such damage.

The single specimen at the Morris Arboretum seems to have had its planting requirements met; it is doing quite well on the south-facing slope west of the Holly Collection. This plant was obtained from the Arnold Arboretum in 1962. Its flowers are pink.

Abeliophyllum is best reproduced by cuttings of half-ripe wood in a closed frame. It is a shrub that

forces easily and can bring spring into your home in February.

In 1937 the Award of Merit of the British Royal Horticultural Society was given to *Abeliophyllum distichum* as "a noteworthy shrub for the home grounds". In a protected area plant abeliophyllum with the low-growing, fragrant *Daphne odora*, the sun-loving snowdrop, *Galanthus elwesii*, and the early blooming *Crocus tomasinianus*, and enjoy continuous bloom from February through April.

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Betty Derbyshire attended the Arboretum of the Barnes Foundation and the Ambler School of Horticulture. She was exposed to the plant world at an early age through her father, Samuel N. Baxter, arboriculturist and landscape gardener. At present, she is a part-time staff member of the Educational Department of the Morris Arboretum.

shrub profiles

AUCUBA JAPONICA

by Hui-Lin Li

One of the most striking of shrubs is the Golddust Tree, a variety of the Japanese aucuba, *Aucuba japonica* Thunberg 'Variegata'. A large-leaved evergreen whose green foliage is dotted with numerous small yellow spots, the Golddust Tree has been exceedingly popular in Europe ever since its first introduction from Japan in 1783. It is one of the most common shrubs in borders and windowboxes, along the streets and in gardens in most of Europe's great cities. According to Rehder's *Manual of Cultivated Trees & Shrubs*, Japanese aucuba is considered hardy in the United States as far north as Washington, D.C. Other authorities suggest that it is hardy farther north, but only in sheltered localities. In the Philadelphia area, it is fairly hardy in nearly all parts of the city and its environs. *Aucuba japonica* can be more widely used as an effective landscape adjunct in all situations but the most open and exposed.

Aucuba japonica Thunberg is a native of Japan and long cultivated there as an ornamental plant with many horticultural varieties. The species is a robust shrub attaining to a height of 15 feet with stout, green, forked branches. Its leaves are oppositely arranged, large, thick, elliptic-ovate in shape, sparsely and coarsely soft-toothed along the margins. The male and female flowers are small and purplish, and are borne in terminal clusters on separate plants. The male clusters are longer than the female. Female plants bear short-stalked, bright red, berries in clusters two to three inches long.

The shrub's showy fruits develop in September and often stay on the plant until March. Thus in winter the evergreen foliage is complimented by the scarlet fruits for a very ornamental effect. Female plants, however, should be provided with male plants in insure fruiting.

Aucuba japonica Thunberg 'Variegata'

'Concolor', the totally green and typical form of the species, was introduced to the western world in 1861, a later date than the variegated form. While not so widely planted as the latter, it is certainly a very desirable landscape plant. The large, dark green foliage not only stays on the plant throughout the winter, but will not curl or droop in freezing temperatures as do other broad-leaved evergreens. Planted against walls, under trees, or as a background plant, 'Concolor' blends well with other evergreen and deciduous vegetation. 'Variegata', or Golddust, is more striking and is better used as a specimen plant.

. . . in flower

There are many varieties of Aucuba besides the two mentioned above. They include forms with varied yellow-spot patterns, varied leaf shape and size, and differing berry color. Worthy of note is variety 'Longifolia', whose green, narrow, oblong-lanceolate leaves give a very graceful appearance.

Aucuba is a plant of the forest and is therefore best suited to a semi-shade situation. It grows well in any good soil, preferably moist but well-drained. Aucuba withstands dust, soot and smoke, a characteristic which recommends it for urban use. Another asset of this plant is its ease of propagation. Cuttings of half-ripened green wood root readily in any season of the year.

A few of the early accounts in English on *Aucuba japonica:*

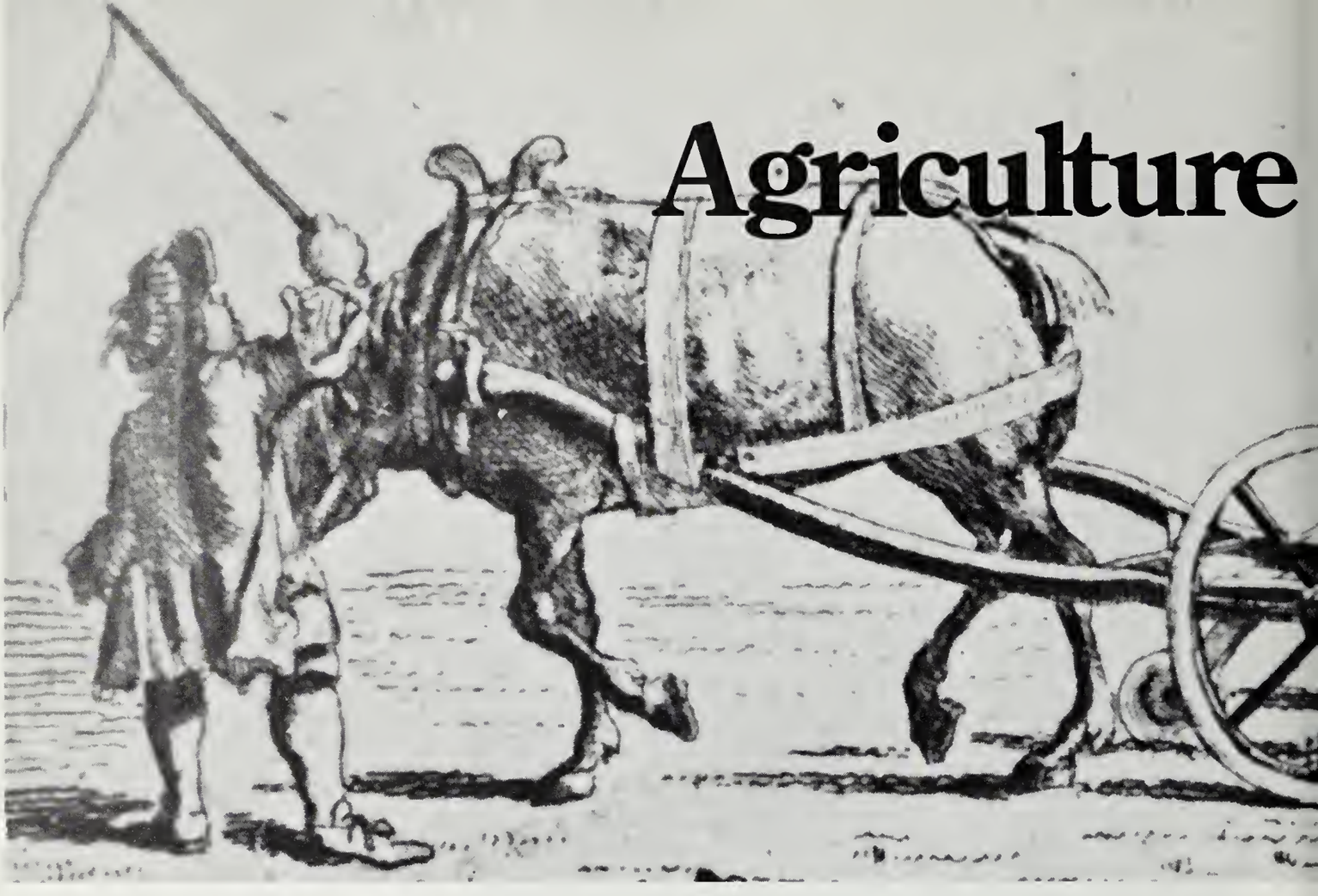
Fortune, R. "Notes on the aucubas of Japan". *Gard. Chron.* 1864:292-293. 1864.

Hooker, J. "Aucuba japonica". *Curtis's Bot. Mag.* 91:pl. 5512. 1865.

Lindley, J. "Notes on *Aucuba japonica* Thunb." *Gard. Chron.* 1864:243-244. 1864.

Sims, J. "Aucuba japonica". *Curtis's Bot. Mag.* 31:pl. 1197. 1809.

. . . in fruit



Agriculture

by Elizabeth C. Walker

Sequel to "Horticulture in Colonial Philadelphia" by Elizabeth C. Walker, *Morris Arboretum Bulletin* XXV, No. 3

As we approach our Nation's Bicentennial, the problems and plight of the farmer are constantly presented to us. His costs have gone up and so has the value of his land, particularly if he lives near the mid-Atlantic states megalopolis. He is tempted to give up and let the developer take over. As costs have risen, family "back-yard" vegetable plots have become more commonplace. The tendency is to become more self-reliant, as the colonists were. We know we have agricultural problems in the 20th century. Let's look at some of the agricultural problems and practices of the 18th century.

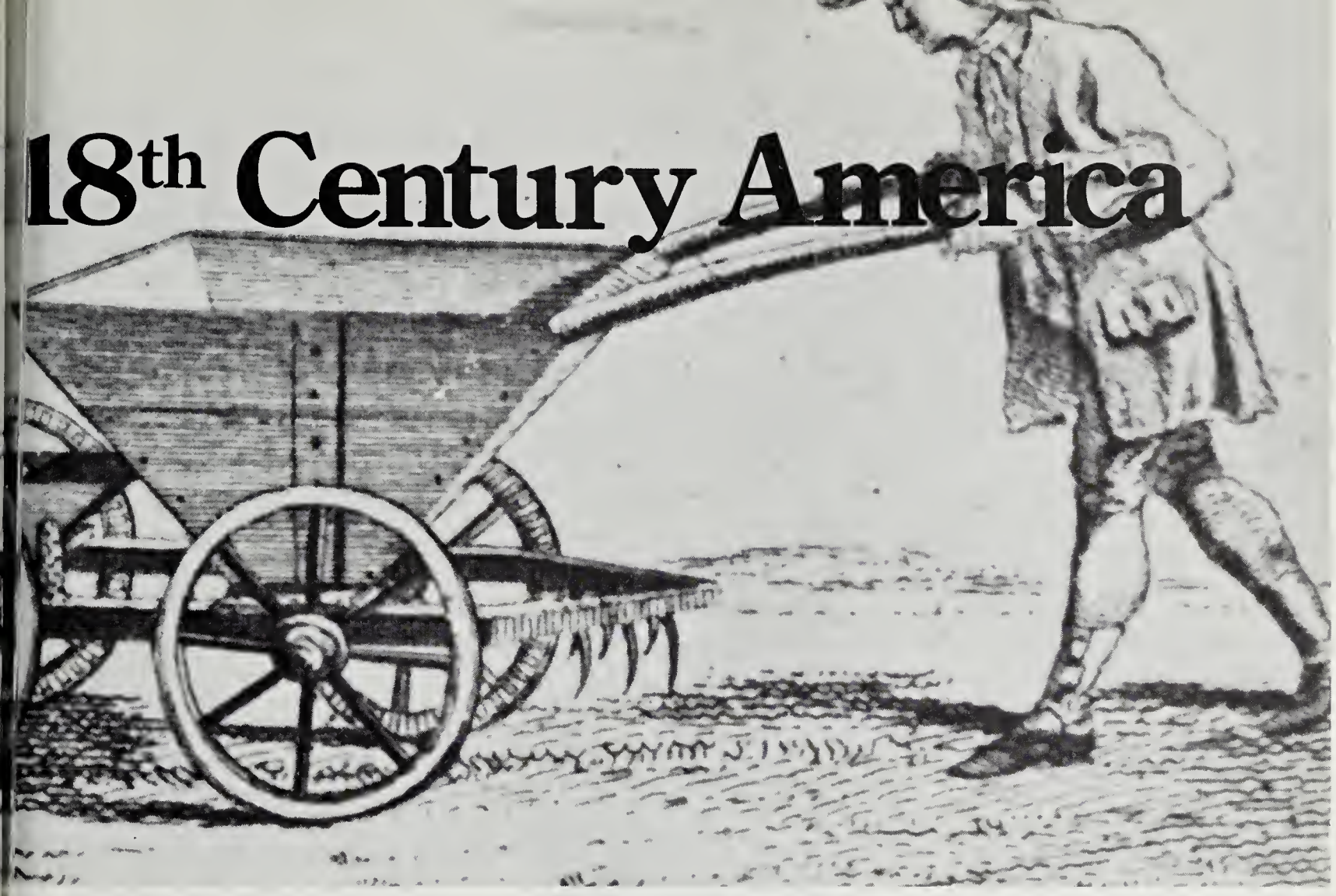
In the farming methods of early Pennsylvania and other colonies, land use was extravagant. Land was the cheap commodity – labor dear in proportion. Each man wanted to be his own master in this new world and that meant owning and tilling his own soil. When fields wore out they were usually abandoned and new ones developed. Thanks, however, to such men as James Logan and his son William and grandson George, John Bartram, Benjamin Franklin, and Judge Richard Peters, agricultural practices in Pennsylvania were reported to be somewhat better than in the rest of the country. The Society for Promoting Useful Knowledge, founded by Franklin in 1743 and later to join with the Philosophical Society, studied the problems of agriculture as well as other sciences. Papers were presented dealing with this subject, and information and the results of experiments were exchanged between men here and in Europe. A sampling of the minutes of the Society reveals papers on or discussion of such matters as:

"The Society taking into consideration the best Means of destroying Garlic out of the field, where it grows, have agreed by Public Notice in the News Papers to request the Favour of any Gentleman acquainted with that Subject to communicate to the Society any Method that has been found effectual for that Purpose."

There was to be compiled: *"A catalogue of such foreign plants as are worthy of being encouraged in our American Colonies with directions for bringing over seeds and plants from foreign countries in a state of vegetation."*

A botanical garden was *"ordered to be planted on 200 ft. of the Arch Street lot next to the Observatory"*. Messrs. Hopkinson and Rittenhouse were appointed a committee to *"look out for a gardener"*.

18th Century America



Papers were delivered on fertilizers, crop rotation, stove rooms and greenhouses, and the problem of canker worms in peaches. Before the century was out the Society's membership included eminent Europeans as well as such men as Washington, Jefferson and Adams.

In a letter from George Washington to Arthur Young, a leading English agriculturalist and Fellow of the Royal Society, we read:

> *"... The aim of the farmers in this country, if they can be called farmers, is not to make the most they can from the land, which is or has been cheap, but the most of the labor which is dear; the consequence of which has been much ground has been scratched over and none cultivated or improved as it ought to have been."*

In another letter he refers to this statement, evidently in answer to a query:

> *"The history of it is this; a piece of land is cut down and kept under constant cultivation, first in tobacco, and then in Indian corn (two very exhausting plants), until it will yield scarcely anything; a second piece is cleared and treated in the same manner, then a third, etc... It is but justice however to Pennsylvania, to declare that her husbandry (though not perfect) is much better, and her crops proportionately greater."*

In another letter to Young, Washington discusses crops for soil enrichment and rotation and ends up asking Young to send him

> *"... a little of the best kind of cabbage seeds for field culture; 20 lb. of the best turnip seeds for ditto; 10 bushels of sanfoin seeds; 8 bushels of winter vetches; 2 bushels of rye grass seeds; 50 lb. of hop clover seeds and if it is decided, for much has been said for and against it, that burnet as an early food is valuable I should be glad of a bushel of this seed also."*

While on the subject of this correspondence, the following extract from another letter written after he had retired from the Presidency and was no longer so young in years, reveals a still youthful enthusiasm for innovation:

Figure above: a seed drill from William Ellis's *The Farmer's Instructor*, second edition, 1750

All illustrations in this article are courtesy of the Library Company of Philadelphia.

"I have a prospect of introducing into this country a very excellent race of animals also, by means of the liberality of the King of Spain. One of the jacks which he was pleased to present me (the other died at sea) is about 15 hands high, his body and limbs are very large in proportion to his height; and the mules which I have had from him appear to be extremely well formed for service. I have likewise a jack and 2 jenetts from Malta, of a very good size, which the Marquis de la Fayette sent to me. The Spanish jack seems calculated to breed for heavy slow draught; and the others for the saddle or lighter carriages. From these altogether, I hope to secure a race of extraordinary goodness which will stock the country. Their longevity and cheap keeping will be circumstances much in their favor. I am convinced from the little experiments I have made with ordinary mules . . . that those of a superior quality will be the best cattle we can employ for the harness; and indeed in a few years I intend to drive no other in my carriage, having appropriated for the sole purpose of breeding them, upwards of 20 of my best mares."

Seal of the Society for Promoting Agriculture.

During Washington's time as President the members of the Philosophical Society discussed the need for promoting good agricultural practices nationally and urged him to prod Congress into passing legislation to promote it. From time to time he addressed Congress on the necessity for a National Board of Agriculture. In his last message to the Congress on December 5, 1796, he forcefully presented the need for such a Board "to stimulate enterprise and experiment, to draw the results everywhere of individual skill and observation to a common center and to spread them thence over the whole nation." Thus the germ of the present Department of Agriculture was fostered.

A typical 200 acre farm in Pennsylvania, as described in 1791 in response to a national survey initiated by Washington, would have had 125 acres in arable land:

"Pasture 50 acres. The course of cropping pursued here requiring 3 fields to be under tillage. Two of course will be left for pasture which makes 50 acres.

"Orchard, etc. 10 acres – orchard, garden, house, and barn, yards, lanes, etc., supposed to occupy 10 acres.

"Meadows 15 acres – the natural meadows in this part of the country being few, yet as every farmer finds means for allotting some portion of his land for that use, suppose the nearest average 15 acres.

"Woodland 50 acres – Timber being an article indispensably necessary for fuel, fencing, building, etc. we have allowed 50 acres for that use."

This shows a vast improvement over the farms in the first part of the century. Then the only fences were around the cultivated areas to keep the animals out. The live stock was turned loose to fend for themselves. Even in winter they were not housed in barns. Their only protection was a roofed-over platform for the fodder which they could reach through the widely spaced boards. The pigs were equipped with yokes to keep them from getting through the fences and hedges, and foraged for acorns in the woods and for whatever they could find in their wanderings along the roads. Consequently, the animals were lean and small. To make matters worse the scanty fare to be found in the forested area was made even scantier by the practice of burning the fallen leaves in the woods. The mistaken purpose was to promote the growth of grass, which it might have done had the native grasses been perennial as in Europe rather than annual. Ordinances then, as now, were passed against the burning of leaves, with very little attention being paid to them.

As, in the beginning, the animals were left to roam, this meant there was no accumulation of manure for fertilizing the fields and gardens, which made for quicker exhaustion of the fields. Had it not been for the experiments in crop rotation and fertilizers, and the good practices and advices of the members of the Philosophical Society, Pennsylvania's farms would not have merited Washington's words of commendation.

The farmers had not only to contend with the forest, but also with swamp land where rivers and creeks overflowed, and with barren sandy areas where nothing seemed to grow. The swamp land was cleared of trees and brush. When drained by means of erecting banks, somewhat like the dykes of Holland, it became converted to meadows and this excellent bottom land

produced good fodder.

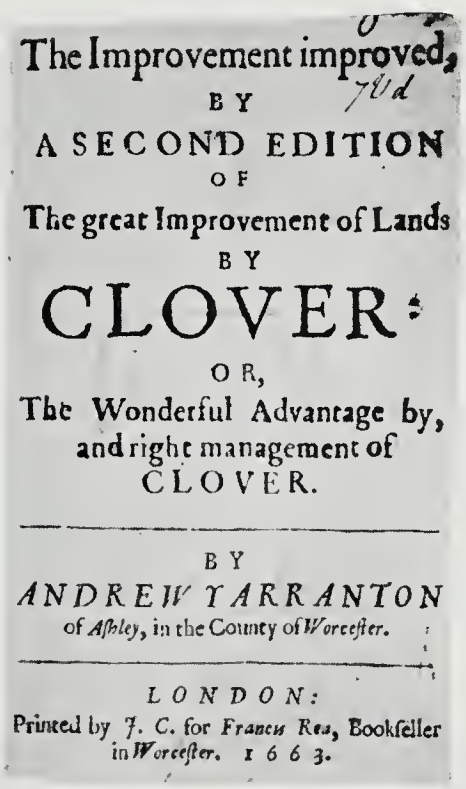
John Bartram devised a system for converting an area of barren, sandy soil into a rich plot for his orchard and meadows, a system which was followed by others when they saw the result. He diverted a spring into reservoirs into which he threw lime, ashes, horse dung, etc., and twice a week let it run. In the fall he spread over the ground old hay, straw and whatever damaged fodder he had in his barn. He also knew the benefits to be derived from clover:

> "... *Within the banks of my meadow ditches I have greatly enriched my upland fields; those which I intend to rest for a few years I constantly sow with red clover, which is the greatest meliorator of our lands. For two years after they yield abundant pasture. When I want to break up my clover fields, I give them a good coat of mud, which hath been exposed to the severity of 3 or 4 of our winters. This is the reason that I commonly reap from 28-36 bushels of wheat an acre; my peas, oats and Indian corn I raise in the same proportion.*"

The first mention of alfalfa (Burgundy trefoil) in the colonies occurs in 1738 when Collinson sent seeds to James Logan via Bartram.

James Logan was particularly interested in Indian corn (maize). His papers on his study of its sexual reproduction were published in Latin in Leyden and were later translated and published in other languages. There had been up to this point various theories on how plants reproduced and this was a study that fascinated anyone interested in botany.

James Logan, his son William and his grandson George all experimented with fertilizers to improve yield and quality of their crops. One of the fertilizers in the latter part of the 1700's was the subject of considerable experimentation in England and here. Washington's friend, Arthur Young, extolled the virtues of "plaster of paris" (*sic*) as a fertilizer. The members of the Philosophical Society and of the Philadelphia Society for Promoting Agriculture, which had been organized in 1785, tried it out. Some of the books on colonial gardening mention this experimentation and go on to state that at Stenton where it was tried (by George Logan) "one could see the initials in the grass". This statement was evidently picked up from Deborah Norris Logan's *Memorial of George Logan* in which she mentions his interest in agriculture and states that he experimented with "gypsum" which was "successful at first", the grass brighter green and the sod thicker so one could "read words and initials". Washington's correspondence with Young, however, seems to refute this. He also was a member of the Society for Promoting Agriculture and reported to Young that he had "tried applying it at every different season of the year, and both wet and dry" and could detect no difference. He also reported that George Logan had filed a report to the same effect with the Philosophical Society, a copy of which was to be forwarded to Young.


The Improvement improved,
BY
A SECOND EDITION
OF
The great Improvement of Lands
BY
CLOVER:
OR,
The Wonderful Advantage by, and right management of
CLOVER.
BY
ANDREW YARRANTON
of Astley, in the County of Worcester.
LONDON:
Printed by J. C. for Francis Rea, Bookseller in Worcester. 1663.

Title-page of the first English book on clover.

Before James Logan started his investigation of the sexual reproduction of corn, Cotton Mather, the eminent New England divine and a Fellow of the Royal Society, was intrigued by hybridization as the result of an accident which befell a friend. This he first described in a letter in 1716. It seems his friend had a squash patch. The squash were so luscious someone was tempted to steal them. In an effort to thwart the theft the man planted gourds alternately with the squashes hoping the thief would not recognize the one from the other and take home the inedible gourds. As up to this time hybridization was unknown, it seemed a good and reasonable idea. But, as so often happens with the best laid plans of mice and men, things went awry. The bees mixed everything up and neither the poor farmer nor the thief got any good squashes. Mather in 1720 further described the hybridization of red, blue and yellow Indian corn, and that of squashes and gourds in his *Religio Philosophical*. Still later Bartram also experimented with hybridization and wrote a friend in 1739 about achieving new colors in flowers by means of cross pollinating.

Orchards in Pennsylvania also received much attention. They included nut as well as fruit trees, but it was the latter which attracted the most attention. In addition to the seedling stock brought from Europe, the colonists found many native ones. Some of the natives were thought better; some not so good. European grapes were brought in at an early date as those of the country seemed inferior. The imports did not adapt, but in the next century it was discovered by a gardener in Virginia that a European vine grafted onto a native plant would thrive.

Right: frontispiece and title page of *Systema Agriculturae*, a book much in use by the 18th century farmer. The frontispiece illustrates an ideal farm whose layout is explained in a poem reproduced in part below.

First cast your eyes upon a rustic seat,/ Built strong and plain, yet contriv'd and neat;
And situated on a healthy soil/ Yielding much wealth with little cost or toyl
Near by it stand the Barns, fram'd to contain/ Enriching stores of Hay, Pulse, Corn and Grain;
With Bartons large and places where to feed/ your Oxen, Cows, Swine, Poultry, with their Breed.
On th'other side, hard by the House, you see/ The Apiary for th'industrious Bee.
Walk on a little farther and behold/ A pleasant Garden, from the high Winds and Cold
Defended (by a spreading fruitful wall,/ With rows of Lime and Fir-trees straight and tall,) . . .

The orchards were ploughed and seeded with all manner of crops, including maize, rye, and oats. Trees were pruned, innoculated, budded, grafted and slipped. Apples, pears, peaches and grapes were the most valued at first. The Dutch had introduced apricots and figs and some attention was turned to them in the latter part of the century. Quinces also appeared at an early date. The native crab apple seems not to have been appreciated but for vinegar and as a flowering tree for ornamentation.

Cherries were considered more of an ornament and were planted widely for this purpose, although they were enjoyed for their fruit and the resultant wine. From all accounts it appears, however, that they did not have a place in the orchard but rather along the roadside fences. Travellers mention plucking bunches of them to eat as they coached their way to their destinations. One of the most popular taverns in the early 1700's was known as "The Cherry Garden Tavern" and it did indeed have a cherry garden, supplemented with exoties in pots for added enjoyment during the summer. It must have been a lovely spot in which to quaff a cup or two and doubtless brought double to its proprietor in attractiveness of surroundings and the wherewithall for liquor at one and the same time.

Peaches seem to have been particularly beloved. They and their problem, the canker worm, constantly figure in reports. A newspaper advertisement in 1798 reads:

"The subscriber takes this method to inform his friends and those gentlemen who delight in rural improvements, that he still continues to carry on the nursery business in its various branches: has now for sale some thousands of the best improved peach trees, and a great collection of grafted apple trees, apricots, gooseberries, currants, etc. some flowering shrubs, forest and ornamental trees too tedious to ennumerate. Gentlemen, ambitious of a choice in the above, are requested to make speedy application.

"The subscriber having taken some assistance to his business, will undertake the work of several gentlemen's gardens by the year, month, or day, as may be agreed upon. Likewise will undertake to perform an operation in his business, never before attempted, namely to extirpate the Canker and remove all disorders incident to the peach tree so much complained of by the admirers of this excellent fruit.

"By long experience both in Europe and America, and constant practice in the pursuits and assistance of nature, the subscriber thinks himself qualified to give general satisfaction to those gentlemen who honor him with their commands.

William Leeson
Northern Liberties, Feb. 23, 1798"

(We hear no more of Mr. Leeson and one wonders if, perhaps, the canker got the better of him.)

Fruit culture, it would seem, had more attention paid to it at an early date in this area than in the other colonies. Books on this subject published in England in the seventeenth and eighteenth centuries were on many private library shelves and, judging from the inscriptions of the fly-leaves, were much passed around. They contained instructions for grafting, budding, innoculating and slipping as well as when to gather the fruit. (*The Practical Fruit Gardener* by Stephen

Worlidge

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By *J. W.* Gent.

Virgil. *O fortunatos nimium, sua si bona norint, Agricolas.*

LONDON, Printed for *Tho. Dring*, at the *Harrow* at the corner of *Chancery-Lane* in *Fleet-street*, 1681.

Switzer, pub. 1763 in England, the fruits "are best gathered early in the morning when the dew is still on them.")

An even earlier book, *Systema Agriculturae, the Mystery of Husbandry Discovered* by Worlidge, published 1681, deals also with the improvement of fields by use of crops of clover, grass, sanfoin, vetches, etc., and then goes on with instructions for fishing, weather prognostication, fertilizers, and "A Cure for Ill Neighbors" which advises the reader to "invite them often and fill their belly . . . commend them . . . please a little their Natures and feed their Humours in what they delight."

Even the city dwellers with their small gardens seem to have tried their hand at selective propagation as we find Joseph Breintnall made a print of a leaf which he labeled "leaf from a tree I innoculated last year – 1733".

One of our favorite pears today, the Seckle, appeared on a farm belonging to Laurence Seckle. As a member of the Society for Promoting Agrieulture he was naturally on the look-out for and interested in propagating any new fruit which might "sport" and seemed worthy of a future.

Today we can put on our tables what would have been in Colonial days an unheard of variety of fruits and vegetables. We owe this bounty to people like Laurence Seekle whose enquiring minds have, down through the years, sought out new methods and products in the field of agriculture.

books

China's Border Provinces; The Turbulent Career of Joseph Rock, Botanist-Explorer By S. B. Sutton. Hastings House, New York. 1974. $9.95.

LIFE OF AN ECCENTRIC BOTANIST

This book is the biography of perhaps the most unusual personality among botanists of this century, Joseph Rock. The author has succeeded, by assembling data from diaries, unpublished papers, and the testimony of contemporaries, in produeing a very interesting, readable and informative book. It will be of particular interest to students of modern history for its many accounts of social and political conditions experienced or observed by Roek during his quarter-century sojourn in the remote western China borderlands. His stay in these inaccessible provinces covered the critical years of the 1920's to the 1940's, during which Rock observed the fighting among local warlords, the coming of the Nationalists, the invasion of the Japanese, and the subsequent takeover by the Communists in 1949.

Joseph Francis Rock was born in Austria under a different name and emigrated to the United States as a young man. He eventually settled in Hawaii and, besides learning English, acquired a knowledge of several other languages. He was self-educated in Chinese as well as in botany and eventually became Professor of Systematic Botany at the College of Hawaii. He also claimed to have been Professor of Chinese at the same institution. Rock alleged that he had been affiliated with the University of Vienna, and that he possessed a doctor's degree. The author has not found any records to substantiate these claims and it is assumed that Rock fabricated the story "to save face among his academic colleagues".

Readers of the National Geographie Magazine in the '20's and 30's would remember the vivid aecounts of Rock's explorations in the western China borderlands, together with numerous splendid photographs taken by him. The major portion of Ms. Sutton's book

Joseph Rock in the native costume of the Choni. ©National Geographic Society.

treats the years Rock spent in that remote land, exploring the flora and fauna, and studying the peoples and geography. His stay was sponsored variously by the U.S. Departmcnt of Agriculture, the U.S. Natural History Museum, the Arnold Arborctum of Harvard University, and the National Geographic Magazinc. His dealings and bickerings with these institutions and their personnel give insight into the cantankerous and difficult nature of Joseph Rock.

The area of western China in which Rock spcnt the greater part of his time was the northernmost Yunnan province, a high mountainous region along thc east side of the Himalayan-Tibetan tableland. The rugged mountains were sparsely populated by aboriginal tribesmen, while Chinese settlers occupied the lowlands. The area's alpine vegetation is the most luxuriant of the world, and thc land produces prccious natural products including gold. It was Shangri-la for Rock. He lived alone among the tribesmen in a splendor that rivalled their kings.

Rock was a man of great eccentricity and bias. He was never "at home" in civilization – in Europe or America conferring with present or prospective sponsors, or among westerners in the coastal cities of China. He despised the Chinese for their opprcssion of the peoples he liked; he considered the Japanese the "Yellow Peril". He loved the Nakhi and thc other mountain tribesmen among whom he lived, but he thought of them "as children or graceful animals, and treated them accordingly". While he ranted and raved against western civilization, he remained absolutely convinced of the white man's superiority.

Although Rock has been considered well-versed in Chinese history and culture, in this portrayal his insight seems vague and his understanding of contemporary happenings superficial and without historical perspective. The author says, "What is curious . . . is that instead of producing the sympathy and understanding which came to most foreigncrs who made the effort to learn about China, Rock's historical investigations had quitc the opposite effcct." In this reviewer's opinion, Rock's negative attitude resulted from both his native cccentricity and from the likelihood that his knowledge of Chinese history and culturc was not really as versed as he claimed it to be.

Rock's real contributions to science are his studies of the Nakhi people and his botanical explorations. He collected more plant specimens from this area in China than any collector beforc or after him. The Yunnan alpinc vegetation is not only the most botanically varied and interesting, but also one of the least known of the world. Rock's collections, as deposited in several major western herbaria, have probably been only partially studied. This reviewer, in monographing the alpine genus *Pedicularis* in China almost thirty years ago, discovercd and described 52 new species; 21 of this number were from Rock's collections.

It is unfortunate that the author of this book does not give an account of Rock's botanical observations or investigations. The author is aware of this when she says she hopes "someone will one day publish a detailed study of the botanical contributions of this extraordinary man".

Hui-Lin Li

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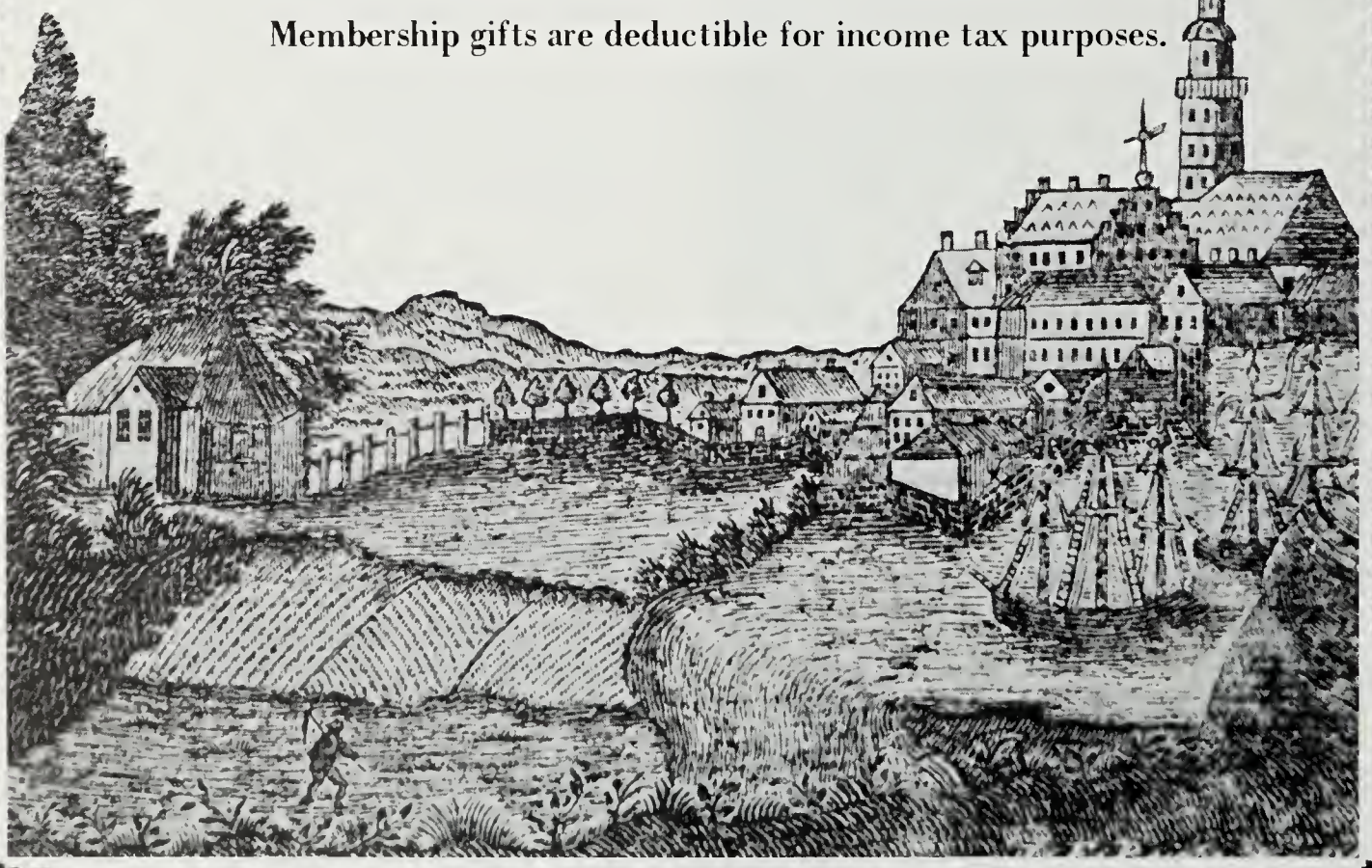

MORRIS ARBORETUM

JUNE 1975 BULLETIN 26 (2)

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THE MORRIS ARBORETUM BULLETIN

Volume 26 Number 2, June 1975

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COVER: "Herb teas" are growing in popularity, both as substitutes for coffee and common tea, and as self-administered panaceas. Author Morton explores some commonly used "herbal" tisanes, their active constituents, and bodily affect. See Page 24. Illustration: *Tilia Europaea* from *Commentarii in libros sex Pedacii Dioscoridis*. Petrus Andreas Matthiolus. Venice. 1565 .

EDITOR: Hui-Lin Li ASSISTANT EDITOR: Susan B. Blum

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Miss Lydia Morris at the site of the future rose garden.

Miss Morris's roses didn't have thorns

by Susan B. Blum

Roses were a favorite of Miss Lydia Morris, co-founder of the Morris Arboretum. Such favorites were they that when a blight at the turn of the century destroyed the many native Chestnut trees on the slope below the mansion, a rose garden was Miss Morris's wish for the new landscaping. The site had held small plantings of grapes and annuals; now the whole area would be terraced and a formal garden layed in.

John Tonkin, superintendent for Miss Lydia and for the Arboretum until his retirement in 1961, told us recently some of his personal recollections of the rose garden construction.

The design of site, rock walls and beds seems to have grown from an informal consensus among Mr. Tonkin, the surveyor Mr. Strassburger and, of course, Miss Morris. One item upon which all agreed was the need for "fancy steps" at the northeast garden entrance; those installed were copied from a residence on West Highland Avenue.

Terracing the hillside proved a major undertaking. Much soil had to be removed and to facilitate its disposal a small train and track were constructed from the site to the greenhouse area.

A rock wall was planned which would retain the slope and serve as a foil for the rose display. But the wall was also to become a display area of alpine and saxatile plants. The stone masons hired to do the job built an excellent wall, stone upon stone — and not room for a plant anywhere. Efforts to dislodge a few stones and mortar brought the structure tumbling down; it had to be rebuilt by the gardening staff — this time with holes. The finished wall garden was a showpiece that early visitors from the Arnold Arboretum and Brooklyn Botanic Garden greatly acclaimed.

Roses were set out in the beds in the early 1920's. Unfortunately, this proved just in time for a serious Japanese beetle infestation. The rose program was delayed and for several years annuals were planted in their place.

But roses did bloom in Miss Morris's garden. Armfuls were carried to her house daily, but not before the staff had carefully removed the thorns. Upon superintendent Tonkin's arrival at the mansion one morning, a lady visitor declared that she didn't like roses; there were always those troublesome thorns. "But my roses don't have thorns, do they, John?" And with a puckish smile he still reserves for the telling of this story, Mr. Tonkin replied, "No, Miss Morris, your roses don't have thorns."

The rose garden planted in annuals circa 1926.

By the mid 1960's the rose garden was in a very poor state. Canker disease had infected most of the roses; the yew borders were spotty, the balustrade broken in places. Because the layout did not permit machine mowing, the garden was often weedy and overgrown. The wall rock garden, a feature which requires many gardener-hours of tending, was all but non-existent, and the wall itself needed repair.

Major renovations were made during the period 1971 to 72. Tests revealed that the soil was far too acid to support healthy rose growth and tons of lime were mixed into the beds. Bedding areas were redesigned to permit machine mowing. Dead and damaged yews were replaced. Two firms, Jackson and Perkins and Star Roses, donated 2,000 healthy bushes to complete an almost total replacement of the rose plantings. A bequest in the will of Otto T. Mallery financed the replacement of the broken balustrade and the installation of the present fountain. The one acre site, at the geographic hub of the Arboretum's collection, became again the luxuriant formal garden Miss Morris had intended.

Work on the rose garden has continued. Under a continuing program of planting and care, the collection now numbers 965 plants. Of that number, 703 are hybrid tea roses, 100 are floribundas, 99 are grandifloras, 22 are climbers, 37 are old fashioned roses, and four of a type known as rugosas. The old fashioned roses occupy a new planting area on the west slope beyond the balustrade. (The old fashioned classification refers to roses in cultivation before the development of the hybrid tea rose in 1867.)

On June 27, 1974, the rose garden was renamed in honor of Marion W. Rivinus. Mrs. Rivinus's association with the Arboretum has been long and ardent. As a child she often visited the Morris home. She remembers how she and her mother would drive their pony cart to the Morris home when invited to tea. The occasion always began with a stroll through the rose garden, then on to tea at the Log Cabin. Miss Morris had had the rustic cabin built to vary the formality of entertaining in the mansion. However, the "simplicity" of tea at the Log Cabin was always marked by the presence of a liveried butler and maid and a full compliment of gleaming silver.

In later years Mrs. Rivinus's unflagging support of the Arboretum has included service as the first president of the Morris Arboretum Associates, and her support continues as a member of the Advisory Board of Managers of the Morris Trust.

The Marion W. Rivinus Rose Garden is an official display garden of the All America Rose Society. Each spring cooperating rose nurseries send the Arboretum sample plantings of the All America selections for the coming year. The Arboretum in turn provides information on the performance of these new varieties. Award winners to be found in the garden this year are the grandiflora "Arizona," floribunda "Rose Parade," and hybrid tea "Oregold."

The Marion W. Rivinus Rose Garden is in continuous bloom from May to October. With its luxuriant flowers, its bountiful fragrance and, well — a thorn here and there, the frequent visitor will find much to delight in.

William Wright

The Marion W. Rivinus Rose Garden during dedication ceremonies, June, 1974.

SOME TIPS ON ROSE CULTURE

by Gordon A. Brandes

New rose bushes are usually dug from the field the autumn, held through the winter in cold storage, and marketed in early spring. It has taken at least two years to produce a good field-grown rose bush. First the root stock, chosen from among hardy wild roses, must be started in the field. The cultivated variety is bud-grafted to the root stock. This grows into the noticeable bud union, a swollen knot at the base of the plant. The grafted plant is then grown in the field for one more season before being dug for sale.

PLANTING . . .

Late March through April is the best time for planting. When new bare root plants are received from the nursery they should be opened immediately and the roots plunged in water for several hours or over night. Any broken, damaged or crossing roots are pruned away and those remaining are spread evenly over a mound of soil in the bottom of the planting hole.

The planting hole should be several inches wider in each direction than the rootspread to accommodate the roots without twisting or crowding. A shovelful or two of peat moss, compost or well-rotted manure is mixed into the soil at the bottom of the hole before setting in the bush. Chemical fertilizer should not be used at the time of planting but added to the soil surface about a month later. Loose soil should be filled in around and over the roots using a dowel as a tamping stick to help remove air pockets. Soil should be firmed lightly with the foot, not jammed with the heel.

The bush should be planted with the bud union about one inch above the undisturbed soil level of the bed; when the bush settles the union will then be at the soil surface. If planted too shallowly the root-stock may throw shoots; if planted too deeply, it may interfere with new cane growth. A basin should be formed in the soil around the new plant to hold water. A good soaking with the hose should follow planting. If there is no rain within a week, water again; however, this is seldom necessary during a Philadelphia spring.

PRUNING . . .

New bushes should be inspected and cut back to about 12 inches in height and to two or three outwardly pointing canes. Canes under the diameter of a pencil should be removed. Old bushes should be pruned about the time forsythia blooms (usually the first week of April at the Arboretum). Remove dead canes down to the bud union; those with canker disease should be cut below the visibly damaged area. Crossing branches should be removed as well as those under a quarter of an inch in diameter, assuming you have two or three strong canes remaining. Cut back

healthy canes to about 12 to 18 inches and preferably to a bud that is pointing outward. This encourages an outward growth for better shape and flowering area.

INSECT AND DISEASE CONTROL . . .

In the Philadelphia area it is impossible to grow roses without controlling two important fungus diseases: black spot and powdery mildew. These diseases respond well to any number of commercially available fungicides.

Black spot begins its activity very early in the spring under normal moisture conditions and even at low temperatures. It is essential to start applying fungicides for black spot control when the first leaves are coming out of the buds. Depending on the frequency of rainfall, sprays should be repeated at weekly to ten day intervals until mid-summer.

Powdery mildew may get started on certain varieties fairly early but becomes a more general problem from mid-summer on. The Arboretum is currently using a basic spray program of *Dithane M45* for black spot with *Karathane* added for powdery mildew control and mite suppression. *Benlate*, a new fungicide, is not effective for black spot but is excellent for powdery mildew. About mid-summer, when black spot declines and powdery mildew is more of a threat, we replace *Karathane* with *Benlate* while maintaining the regular sprays of *Dithane* for black spot.

Insecticides are added to the rose spray whenever insects threaten. Often we find aphids on the tender young shoots very early in the spring. Thrips were very troublesome last year and emerged from the soil quite early. The Japanese beetle is a serious pest on roses but goes in cycles; and occasionally we have damage from leaf feeding caterpillars. We use malathion or diazinon for aphids, sevin for Japanese beetle and worms and dimethoate for thrips. Each insecticide should be used only according to manufacturers directions on the label and only as needed. We have also applied milky spore disease bacteria to the Rose Garden area for the control of Japanese beetles grubs in the soil. This control measure will take time to establish and will not prevent the beetles from flying in at some distance.

FERTILIZING . . .

All bushes receive about six tablespoons of 5-10-5 or 7-7-7 fertilizer at the completion of early spring pruning, usually about mid-April. They will get one or two supplementary feedings during the summer at about the same rate. Well-fertilized plants that are kept free of insects and diseases grow strong robust canes and a profusion of large sized flowers.

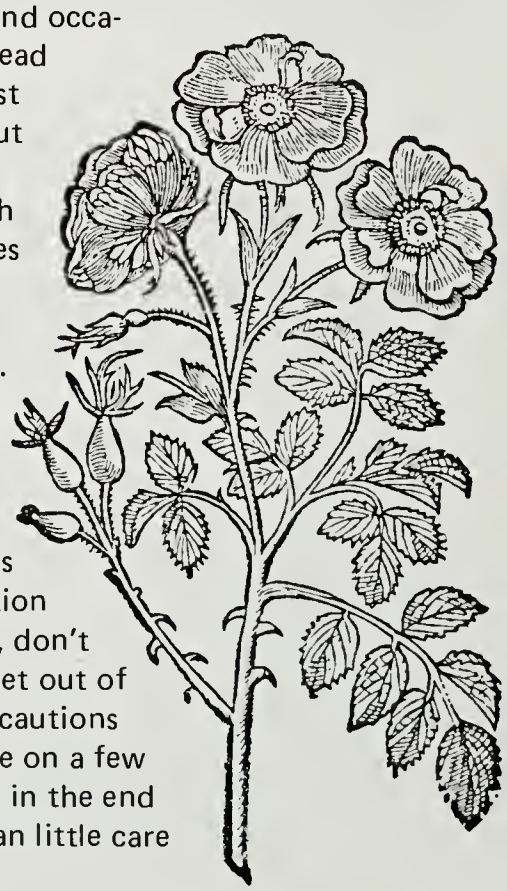
MULCHING . . .

Our Rose Garden is mulched to control weeds and to conserve moisture. In the past we have used Ritedress licorice root. This is expensive for a large garden but still a very satisfactory material because of its good appearance. We are now using hardwood bark, obtainable in bulk quantities from special suppliers and considerably more economical. We also demonstrate other types of mulching material in the Rose Garden, including cocoa hulls and pine bark of various sizes. All are satisfactory and selection depends mostly on cost and appearance. We do not recommend peat moss as a mulch as it tends to seal over and prevent water from entering the soil. With mulching, weeding is virtually eliminated and only in cases of excessively long periods without rain (three or four weeks) would it be necessary to irrigate.

DEADHEADING AND SUMMER PRUNING . . .

Faded blossoms should be removed promptly. Summer pruning usually consists of keeping overgrown canes under control and occasionally removing a dead cane. One of the most rewarding things about roses is their long period of bloom. With proper care most types will provide continuous bloom from late May till October frost.

A final word from David Sedmak, Arboretum rosarian. Though most people would agree that roses are a wonderful addition to almost any garden, don't let your enthusiasm get out of bounds. Mr. Sedmak cautions that high maintenance on a few plants is better — and in the end more rewarding — than little care on many.



Double wild rose from *Plantarum seu Stirpium Icones*. Matthias de L'Obel. Antwerp. 1581.

shrub profiles

Gary Koller

CUMBERLAND AZALEA

Rhododendron bakeri

by Gary Koller

Azaleas in a rainbow of colors burst into bloom in late April and last through May. If you have ever wished that the flowering period could be extended this is possible to achieve by planting the Cumberland azalea.

The Cumberland azalea is an American plant which occurs spontaneously throughout the Cumberland Mountains. Because it occupies such a southern range it was once thought not to be hardy as far north as Philadelphia. In 1952, Henry Skinner, then curator at the Morris Arboretum, was collecting native azaleas as part of his doctoral thesis. *Rhododendron bakeri* was among the native azaleas which he brought to the Morris Arboretum and ever since the Cumberland azalea has been thriving and flowering annually in our climate.

The individual blossoms are quite small but quantity compensates to provide a stunning display. Floral color varies from reddish orange to true red. Natural hybrids can occur with *R. arborescens* to produce floral colors of clear yellow and pink. The tubular, trumpet-like florets have long stamens extending beyond the tube providing a highly ornamental effect.

The height of these plants varies from two to four feet; our plants are fairly uniform at three to four feet tall with a spread of two to three feet. The small deciduous foliage is dark green above and more or less glaucous beneath.

Why is this plant so unfamiliar? As with many native plants this rhododendron is often shunned in favor of its more exotic cousins. Few people who live outside the plant's natural range know of it and therefore it is not frequently requested from the nursery industry. It is also a difficult plant to propagate. In the past, most nursery specimens have been collected from the wild — a practice which slowly robs America of one of its great natural gifts.

At the Arboretum we have tried propagation by cuttings, using varied propagating techniques, but with no success. Seedlings seem to offer the most promise, but their slow growth frustrates even the most patient gardener. Faster growth can be had by lighting the seedlings with 60 to 100 watt incandescent bulbs and extending the growing day to 16 hours.

R. bakeri thrives in a soil with a high organic matter content and an acid pH. Best floral production occurs in full sun, but the plant will thrive in light shade. There seem to be few insects, pests or diseases which affect *R. bakeri*.

The nomenclature of this plant is confused. The plant found in the Cumberland Mountains by one collector was properly described and published under the name of *R. cumberlandense*. Another azalea with similar characteristics was described and called *R. bakeri*. The two species were believed to be distinct and separate until Dr. Skinner explored the natural range of both plants and found that their ranges merged into one. They are now believed to be geographic variants of the same species, though taxonomists are still working on this complex problem.

The rarity of this plant makes it difficult to purchase locally. I would therefore suggest one of the following mail order nurseries which specialize in unusual azaleas and rhododendrons:

Greer Gardens
1280 Goodpasture Island Rd.
Eugene, Oregon 97401

Warren Baldisefen
Box 88
Bellvale, New York 10912

At the Arboretum plants grow in the native azalea collection at the northwest end of Cherry Lane. A large group of 10 to 15 plants is in the azalea bed along the drive just northeast of the Heath Garden. In late June, as the predominate landscape color returns to green, we invite you to visit the Arboretum to see and enjoy the Cumberland azaleas in their fiery-red glory.

Is There a Safer Tea?

Julia F. Morton, Director, Morton Collectanea,
University of Miami, Coral Gables, Florida

Presented at the American Society of Pharmacognosy and Academy of Pharmaceutical Sciences Section on Pharmacognosy and Natural Products Joint Meeting, University of Illinois, Aug. 6, 1974.

My study of folk remedies during more than eight years of intermittent field work in the Netherlands Antilles, coastal South Carolina and northwestern Venezuela has revealed a seeming link between gastric cancer and excessive intake of tannin-rich plant decoctions. Many of such brews were originally recommended by old-time pharmacists or physicians for the relief of specific ailments but have come to be regarded as tonics or as beverages, and are taken frequently or even daily, especially by people of a low economic level.

Having observed the very sad consequences apparently resulting from these practices, I view the growing popularity of so-called "herb teas" among the American public with serious concern. The word "herb," of course, is loosely used, for the materials utilized include not only herbaceous plants but barks, roots, leaves, flowers and fruits of trees, shrubs and woody vines. The word "tea" implies that the decoction or infusion of the plant material is a "beverage," and the word "natural," commonly coupled with these products, has, unfortunately, come to be equated with "good." The fact that the plant materials are sold by health food stores and other similar outlets clothes them with the aura of wholesomeness. What is not fully realized by most consumers is that the majority of the plants being so exploited today formerly appeared in texts on medical botany as possessing active constituents affecting one or more organs of the body. They are not necessarily suitable for daily beverage use.

Even ordinary or "true" tea (*Camellia sinensis* Kuntze) was taken only for medicinal purposes when first introduced into England and we now have reason to believe that its widespread adoption as a beverage and the excessive consumption of undiluted tea, with its recognized tannin content, may account for high rates of gastric cancer in certain populations. Dr. Gerhard Haneveld, looking back into the medical history of Holland, has found that the high incidence of esophageal cancer in that country during the 18th and 19th Centuries coincided with overindulgence in tea, and the disease drastically declined when coffee became the national beverage.

Among the world's great tea drinkers are the Turkmen of central Asia, among whom esophageal cancer is common. (The British drink tea with milk which binds the tannin; the Dutch, the Turkmen and Orientals do not.) Last October, Dr. Mitsuo Segi, President of Mizuho College, reported to the Japan Cancer Congress that, following the tannin/cancer theory that I have put forward, he made a successful correlation between the habitual consumption of tealeaf-rice gruel and high death rates for esophageal cancer in certain provinces of Japan.

Among medical practitioners, emphasis has been laid on the caffeine content of the two most widely consumed hot beverages, tea and coffee, while the tannin content of the former has been ignored. Patients with peptic ulcers, hypertension, and other cardiovascular and nervous disorders are usually advised to give up one or both (21). The beverage industry has failed to provide equally appealing alter-

natives. The need for such alternatives can be emphasized by quoting one sufferer: "Tea is about the only beverage I drink, and I drink quite a lot of it . . . I have noticed, especially this summer, that I have heart palpitations and even chest pains quite often in the evenings; and, every time, I have either just finished a glass of iced tea or even still have it in my hand . . . I can't tolerate coffee at all, unless decaffeinated, even though I was given coffee from the time I was a very small child and it didn't start bothering me until a few years ago, causing nausea, diarrhea, extreme nervousness and loss of sleep."

In September of 1972, a short column in a Philadelphia newspaper refering to my investigation as a study of cancer-causing "herb teas," precipitated an onslaught of more than 200 letters and telephone calls from anxious readers. One individual wrote: "The article stated you did research on tea and you had a list of them for the asking. Having a lot of trouble with my throat and being a tea drinker, I sure would be interested in this list." Another said, "Naturally I am concerned as I drink quite a bit of tea (orange pekoe and pekoe cut black tea) and, of late, my throat bothers me off and on." A gentlemen phoned that his doctor had banned coffee six years before and he then became a tea addict. At the time of phoning, he was having radiation therapy for esophageal cancer.

One correspondent reported drinking seven or eight cups of tea daily; another, ten to twelve. Exhibiting equal lack of moderation, a lady phoned that she has been drinking a half-gallon a day of comfrey or yellow dock tea, her doctor having ordered her to discontinue coffee because of her various ailments. Another wrote: "I am not a tea drinker but started just recently since my doctor took me off coffee, but I buy my tea in the health food stores; mostly I drink comfrey or sage." Others have written: "Because I felt I was drinking too much tea – the regular kind – I have switched to alfalfa-mint whenever possible . . ." "In an effort to cut down on coffee, I have been buying small quantities of certain herbs – eyebright, nettle, horsetail, camomile, even lady's mantle . . ." "Is there any harm in rose hip tea? I do not drink coffee – only tea – and switched to rose hip."

The following excerpts from a few more of the letters are typical: "My wife, her sister and sometimes myself, drink native teas such as mint, sassafras, red clover, parsley tea, dandelion; also we have used a few others such as peach leaves for diarrhea . . ." "I buy my tea in a health food store – natural organic tea – [whose] contents [are] peppermint leaves, alfalfa herb, dandelion root, blueberry leaves, Paraguay tea, rose hips and anise seed." "I have always enjoyed drinking tea but only lately have I begun to use different herbs such as alfalfa, dandelion, comfrey and camomile." "Here are some of the herbs which I use [for tea] – nettle, fennel, camomile, and a mixture, (peppermint, alfalfa leaf, papaya [leaf] and maté)."

Popular tisanes require pharmacognostic study

"I am a tea drinker, using rose hip, maté tea, fenugreek tea, papaya-mint and spearmint teas." "Could you please give me information on comfrey tea? I have been drinking it for my health."

Some are truly taking herbal concoctions not merely as an escape from coffee and tea but partly and hopefully as self-medication for specific ills, as is evidenced by the following quoted passages: "I have been drinking [herb] teas for the past two years . . . One tea I drink is to relieve constipation. It contains buckthorn, senna, juniper berries, Uva ursi, sassafras and dog grass." "We have been using herbal teas for enjoyment and as a diuretic. The diuretic tea contains shave grass, Uva ursi, corn silk, juniper berries, buchu leaves, whole powdered cranberry, horsetail herb, parsley, watermelon seeds, cubebs, goldenrod [and] gravel plant." "Here is a list of the herb teas my husband and I have in our home: blueberry-leaf, papaya-mint, fennel seed, camomile flowers, valerian root, lavender flower tea (French) . . . Blueberry leaf herb tea has been very successful in keeping my blood sugar count low in diabetes along with a capsule for the disease." "I have diabetes and was told that tea made from licorice herb was good to take for it." "Please send me information on the relative value or

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Comfrey, *Symphytum officinale* L.

danger of boneset tea, used to give relief to persons suffering from rheumatism or arthritis . . ."

In turning to "herb tea," either as a beverage or as a panacca, a person may find relief from some of his symptoms, or he may be leaping from the frying pan into the fire, especially since many seem to feel that if a little "herb tea" is good, a large quantity will produce the wished-for miracle of sound sleep, renewed health, vigor and longevity!

It is true that some of the species employed will give satisfaction as laxativcs, e.g. senna (*Cassia* spp.) and buckthorn (*Rhamnus frangula* L.). Others indubitably are active diuretics: juniper berries (*Juniperus communis* L.); dog grass, or quackgrass (*Agropyron repens* Beauv.); watermelon seeds (*Citrullus vulgaris* Schrad.); dandelion root (*Taraxacum officinale* L.); gravel plant, or trailing-arbutus (*Epigaea repens* L.); bearberry (*Arctostaphylos uva-ursi* Spreng.); buchu (*Barosma* spp.), and cranberries (*Vaccinium* spp.) – the last four because of their *arbutin* content (19) – but regular indulgence in infusions or decoctions of these plant materials may provoke undesirable consequences. For instance, juniper berries were officially discarded long ago because the irritant action of juniper oil, their active constituent, "often produced injurious effects on the kidneys" (24). *Epigaea repens* has becn suspected of poisoning cattle, and the bearberry contains so much tannin it has been effective as an astringent in diarrhea and dysentery. In fact, a Russian investigator reported in 1971: "The content of the industrially important tanning compounds was significantly high in bearberry leaves – 27.5%"(17). Blueberry leaves are rich in catechin tannin.

It is evident that many plant materials adopted as tea substitutes are favored because of their resemblance to tea in flavor and astringency, owing to their tannin content. South American maté (dried and often toasted leaves of *Ilex paraguariensis* St. Hil.) has been found to contain 9.05 to 12.4% tannin and 1.17 to 1.2% caffeine as well (27). Lady's mantle (*Alchemilla vulgaris* L.) is rich in tannin, was formerly used as an astringent in cases of diarrhea and hemorrhages and as a styptic on wounds; and has been recommended for tanning leather (1).

Comfrey (*Symphytum officinale* L.) has considerable tannin in the leaves and the infusion of the dried leaves is very astringent. Comfrey root possesses 2.4% tannin (17) and a strong decoction was used in Germany for tanning leather (1). The above-ground plant contains the alkaloids *lasiocarpine* ($C_{21}H_{33}NO_7$) (18), *consolidine* (34), and the *N-oxide* of *heliosupine.* Additional alkaloids have been found in the root (18). The acid fraction of an aqueous extract of the plant has shown antigonadotropic activity in mice (13).

Yellow dock "tea" may consist of the above-ground parts of *Rumex crispus* L., or only the root, or a mixture of both. The plant contains tannin as well as *rumicin* ($C_4H_{10}O_4$), an irritant substance which destroys skin parasites, and, at times, sufficient oxalates and/or nitrate to cause poisoning in grazing animals (30). The root contains 3.62 to 6.42% tanin, also *chrysophanic acid, emodin* and *calcium oxalate* (19). It is both purgative and astringent and has been called a "toxic laxative."

Peppermint (*Mentha piperita* L.) tea is astringent, the tannin level ranging from 6 to 12%. On the credit side, the herb acts as a gastric stimulant and carminative (21) which is doubtless the reason it is often combined with alfalfa for beverage purposes.

In the case of alfalfa, we find a striking contrast between blind belief and fact. According to *The Herbalist*, a publication of the Indiana Botanic Garden, which is in common use as a handbook or popular guide: "An infusion of alfalfa with a bit of mint, makes an excellent tea for daily use. It is one of nature's richest sources of a variety of easily assimilated, natural vitamins, minerals and trace elements" (20). Actually, alfalfa (*Medicago sativa* L.) is fairly high in saponins (2 to 3%) which cause serious bloat problems and respiratory inhibition in cattle, retarded growth in chicks, decreased egg production in hens (2), and trypsin inhibition (16). Alfalfa also

interferes with utilization of vitamin E (15). Autopsies of horses and sheep poisoned by excessive grazing on alfalfa have shown irritation and lesions in the kidneys. The literature on alfalfa toxicity is extensive. Is it reasonable to assume that alfalfa tea is harmless, yea, even beneficial, to people?

Another of the above-cited tea materials of questionable value is sassafras. The chief constituent of its volatile oil is *safrole* (*p-allylmethylene-dioxybenzene*), a carcinogen now banned as a food additive (17).

The responses to a single column in the *Philadelphia Evening Bulletin* constitute only a limited, involuntary sampling of users of "herb teas" and the plants mentioned above are but a fraction of those being widely sold. One dealer's price list which I have before me lists no less than sixty-four individual "teas," plus blends containing parts of a dozen additional plants (22). At least eight more species appear in a catalog of imported gift items (25). *The Herbalist*, in a chapter entitled "Beverage Teas" (pp. 166-177), enticingly presents eighty-six. Tobe (32), in his chapter on "Herbal Teas, Tisanes, Beverages and Ambrosials," sets forth one hundred and seven.

An assortment of a dozen or more may be found at any time on the shelves of one's local gourmet shop as well as in health food stores. Last January, a week after I was contacted in connection with the fatal mistletoe poisoning of a two-year-old child in Washington, D.C., I found on sale at a nearby grocery a package of imported "Mistletoe Tea." The product consisted of dried stems and leaves in pieces large enough to be easily recognized. It was the European mistletoe (*Viscum album* L.), the chemistry of which varies somewhat with the species of tree upon which it grows. In olden times, it was in high repute as a remedy for epilepsy, though large doses admittedly aggravated this disorder (5). It is known to possess narcotic, hypotensive, antispasmodic, tumor-inhibiting (14) and thymus-stimulating activity. It contains *Viscotoxin*, a mixture of toxic proteins (28) which apparently affect RNA and DNA synthesis. Lethal doses of *Viscum* proteins produce anaemia and hemorrhage in the liver, intestinal hemorrhage and fatty degeneration of the thymus in experimental animals (23).

I purchased also "Shave Grass" tea (*Equisetum hyemale* L.), proclaimed on the package to be "A

Julia Morton

The bearberry, *Arctostaphylos uva-ursi* Spreng., is an attractive, low, trailing, evergreen shrub of central and northern Europe, the British Isles and western North America.

Julia Morton

The tea plant, *Camillia sinensis* Kuntze

Natural, Refreshing Beverage." The infusion was prescribed more than 100 years ago as a diuretic and astringent and the plant recommended for tanning leather (1). In addition to tannin, it contains *aconitic acid* and the alkaloid *equisetine*, a nerve poison (10). *Nicotine* and *palustrine* are listed for this species by Willaman and Schubert (34). Blackfoot Indians administered the plant to horses as a drench. Sheep and cattle are poisoned by grazing the fresh plant; horses, usually by eating the dried plant in hay. It produces, especially when dried, sudden symptoms of weakness and loss of appetite followed, after a few weeks, by loss of muscular control, excitement and falling, and, in acute cases, labored respiration, rapid, weak pulse, diarrhea, convulsions, coma and death (10). I have not felt overwhelmingly tempted to drink the "tea" but have sampled it and found it insipid.

A package of "Squaw Tea," received as a gift from Dr. Dennis V. Johnson of Los Angeles, had instant appeal. The product, glowingly described in the accompanying leaflets and declared to be "Good for the whole tribe," consists of the slender, hollow, pale-green branches of *Ephedra viridis* Cov., shade-dried and cut mostly into ¼ to ½ inch lengths. I could find little information on this plant except that Indians of the southwestern United States and early settlers drank infusions of this and related species mainly as treatments for venereal diseases (29). One vernacular name for *E. nevadensis* Wats. is "whorehouse tea". Saunders remarked that these plants are "well stocked with tannin" (29). Hartwell and Abbott found the antitumor activity of *E. viridis* to be due to its tannin content (7). The plant contains the alkaloids *ephedrine* and *pseudoephedrine* (34). An infusion of what was recorded as either *E. nevadensis* or *E. viridis* produced "prompt and extensive contraction of uterine muscle" when applied to smooth muscle strips of virgin guinea pig uteri. In experiments with dogs and rabbits, the infusion caused a "marked rise in blood pressure which persisted for several minutes" (6).

Another "natural beverage" gift from Dennis Johnson is a box of "Saw Palmetto Berries" – "Cut and Sifted Especially for Herb Tea." Labeled *Serenoa serrulata*, the old name of *Serenoa repens* Small, the fruits must be collected in the southeastern United States and packaged in California. *The Herbalist* says: "Palmetto Berries are of great service in cold in the head, irritated mucous membrane of the throat, nose and air passages, and in numerous other conditions. In fact, they have been credited with peculiar virtues. They constitute one of the most valuable remedial agents in the whole materia medica." While hardly rating such extravagant praise, saw palmetto fruits have been more or less regularly gathered for pharmaceutical use over many years. The reputed effect is primarily rejuvenation. According to Wren, the fruit is a "Nutritive tonic, diuretic, sedative. Is highly recommended in all wasting diseases, as it has a marked effect upon all the glandular tissues, increasing flesh rapidly and building up the strength. Should be used in atrophy of testes, mammae, etc." (35). In some circles, the fruit is today being advocated as an aphrodisiac. A valid basis for such claims has emerged from the studies of Elghamry and Hänsel who, in 1969, isolated the potent estrogen, *B-sitosterol*, from the dry fruits of *S. repens* and demonstrated its activity in male mice (3). The fresh fruit is bitter and unappealing. John Smith wrote in 1882: "The fruit, although sweet, cannot be called palatable; it contains a fixed and volatile oil, which is obtained from the expressed juice; when boiled in water the volatile oil is set free, filling the atmosphere for a great distance, and causing dizziness and headache" (31). Much of the objectionable property is doubtless dispelled by drying. Still, the infusion of the dried berries has a somewhat nauseous odor and a weak, sour taste.

Papaya tea — dried, shredded leaves of *Carica papaya* L. — is rather widely exploited today for beverage purposes, though in the Tropics it has only medicinal applications. Mexicans take the leaf decoction as a remedy for asthma. In West Africa, it is given to horses as a purge. An infusion of dried leaves is there regarded as a remedy for stomach troubles, hernia, gonorrhea and orchitis. It is purgative and may cause abortion (11). Malays take the infusion as a vermifuge and in cases of colic. Analyses of dried papaya leaves at the University of Florida showed low levels of tannin (0.5 to 0.6%) and no saponins (8). The fresh leaves contain the proteolytic enzyme, *papain*, and certainly tenderize tough meat wrapped in the leaves for several hours. The tenderized meat, after thorough cooking, I have found pronouncedly laxative. Other properties of the fresh leaves include ascorbic acid (286 mg/100 g), vitamin E (36 mg/100g), and the bitter glycoside, *carpaine* ($C_{28}H_{50}N_2O_4$), present in concentrations up to 0.4%, which depresses the central nervous system and heart action (19). The vitamin content probably diminishes with drying. *Papain* and *carpaine* are destroyed by heat but perhaps not fully inactivated by brief steeping in boiled water. One small producer of papaya tea in Winter Park, Florida, in 1952, advised adding ½ teaspoonful of his product per cup of boiling water and letting it simmer about two minutes before straining (12). Back in 1945, a health food purveyor was marketing PAPSADY, "A Rhapsody in Teas" — a combination of sassafras root and dried papaya leaf. The directions for preparation were to "drop a teaspoonful in boiling water . . . and let boil until reddish color is strong" (9).

Rose hips are acclaimed for their vitamin C content, but 45 to 90% may be lost in drying the hips for sale as "tea" (21). They also contain some tannin.

Among the better-known tisanes of Europe, now finding a ready market in this country, are camomile and linden, both seemingly beneficial to persons with gastric or nervous disorders.

The imported camomile tea is usually the dried flowers of the German, Hungarian, or Sweet, camomile (*Matricaria chamomilla* L.), in which the yellow disk flowers are borne on a markedly conical or cylindrical, non-scaly, eventually hollow receptacle; the white rays each have a single notch at the tip (1). The infusion has been esteemed since ancient times as a stomachic and soothing or sedative brew, often taken to relieve indigestion, insomnia, hysteria, infantile convulsions (1), fevers, and even hang-overs. The flowers contain a little tannin (19) and have been the subject of much chemical study in Europe. Camomile extract has antipeptic action. In large doses, it is emetic. *Bisabolol* and *azulene*, constituents of the volatile oil, have carminative, antispasmodic, antimicrobial, antifungal, and antiinflammatory activity. However, very little essential oil or *azulene* is found in the decoction, which has been shown to contain *choline*, *leucine* and *apigenin* glycosides (33). Infusions showed a marked stimulating effect on the secretory function of the liver when administered to dogs having chronic fistula of the gallbladder (26).

Roman, or English, camomile (*Anthemis nobilis* L.) is very similar to the above, except that the disk-flower receptacle may be convex or somewhat conical, is solid and scaly, and there may be a single or double collar of white rays, each with two notches at the tip. The leaves are not as slim and more numerous. Because of the more pronounced bitterness of Roman camomile, it is used more for medicinal than beverage purposes. The single-rayed wild form is said to be more potent than the double-rayed, cultivated type. The therapeutic uses are much the same as those of the German camomile.

What is not fully realized by most consumers is that the majority of the plants [used as herb teas] today formerly appeared in texts on medical botany as possessing active constituents affecting one or more organs of the body. They are not necessarily suitable for daily beverage use.

Linden tea consists of the dried flowers and floral bracts of *Tilia cordata* Mill., *T. platyphyllos* Scop., or the so-called "*T. europaea*," a hybrid between these two species, which is the common "lime" tree of England. The tea has long been famed in Europe as a remedy for nervousness, hysteria, epilepsy, headache, colds, rheumatism and indigestion. Helen Fox wrote in 1943, "In July, all along the roads of France, wherever the lindens are growing, one sees ladders placed against the trees for gathering the flowers. One summer in Tours, I saw the gardener cut down branches of the trees and bring them into the convent where a group of little children, under the supervision

of a nun, picked off the flowers, while all of them were singing a song for this special occasion" (4). This is a happy picture but Grieve injects a warning: "If the flowers used for making the tisane are too old, they may produce symptoms of narcotic intoxication" (5). The flowers reportedly contain "essential oil, glucosides, mucus, *inosite*, tannins, *hesperidin*, *carotene* and vitamin C". In England, linden flowers are a prime source of honey but the nectar of some species – particularly *T. petiolaris* DC. and *T. tomentosa* Moench – is poisonous to honeybees.

In a recent taste-test of ten of the above-mentioned "teas" (bearberry, buchu, camomile, comfrey, linden, papaya leaf, saw palmetto, shave grass, squaw tea and yellow dock), linden was the only one considered pleasant in flavor and odor by the four tasters. All of the others were rated as unappealing or unpleasant, the highly aromatic buchu being declared the most disagreeable.

Perhaps among the many other "tea" sources which I have not mentioned, there are some that are appetizing and wholesome and worthy of being widely promoted as alternatives to coffee and ordinary tea. I believe this is a problem which warrants the attention of pharmacognosists and the energy and resources of the beverage industry.

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books

NEW YORK TIMES BOOK OF VEGETABLE GARDENING. Joan Lee Faust. Quadrangle/The New York Times Book Company. New York. 1975. $9.95.

This is an attractive book, artfully designed and beautifully illustrated with excellent color drawings by Allianora Rosse. It also contains several good and informative black and white photographs and line drawings. The author's conversational style reads easily and the text contains many interesting bits of garden lore and history. But while the book is wide ranging in its treatment, it is not necessarily comprehensive. The depth of treatment of subject matter is erratic and at times leaves some complex topics unclear.

The handling of the sections on plant nutrient absorption, insects, diseases and control measures is particularly weak. I remain highly skeptical of the suggestion that "experimenting" with certain companion plants will repell specific insects or larger animal pests or will attract them away from other crops. The selectivity and specialization of insects and disease organisms for certain kinds, species or varieties of plants is well-known. Trained plant scientists, entomologists and plant pathologists would discount the validity of such proposed controls.

Some specific errors include the statement that the "process of root respiration" controls nutrient absorption. (I believe the author here means "transpiration.") Or the obvious typographical error, "a soil drench such as diazinon to kill the bacteria." Diazinon is a phosphatic insecticide. It is appropriately recommended as a soil drench for certain insects on page 242.

Beginners could undoubtedly grow a better garden by following the cultural directions in this book. The more experienced gardener will find it less than comprehensive, though interesting reading.

Gordon A. Brandes

ALL ABOUT VEGETABLES, Midwest/Northeast Edition, Walter L. Doty, Chevron Chemical Company, Ortho Division. San Francisco. 1973. $3.98.

This book is a truly comprehensive handbook on home vegetable growing from the patio container to a full-sized, season-long family garden. *All About Vegetables* contains sound, easy-to-follow directions for all the common garden vegetables plus information on lesser known vegetables that are worth trying. Little space is wasted; the book is profusely illustrated with stimulating color photographs and useful drawings and tables. There is a section on culinary herbs, and the ideas for growing in containers, boxes or raised beds are especially innovative. Directions for growing also include many tempting recipes, suggestions for prime quality harvesting and for storing and preserving.

The basics of pest and disease control are straightforward, combining natural and cultural controls with the timely use of approved low toxicity insecticides and fungicides. The editor has relied heavily on information provided by Agricultural Extension vegetable specialists, researchers at state universities, and garden experts throughout the country. *All About Vegetables* is factual and informative. It is the sort of how-to-do book that makes you want to go right out to your garden and get planting.

Gordon A. Brandes

DESIGN LESSONS FROM NATURE. Benjamin De Brie Taylor. Watson-Guptill Publications. New York. 1974. $12.50.

Design Lessons From Nature is a workbook of exercises to better the artist's ability to see, understand, interpret, and design. Nature and its forms — the leaf, tree, seed, egg — are Mr. Taylor's instructional resources and he uses them to demonstrate authenticity and economy in a created form.

Why is this book being reviewed in an arboretum magazine? Justification for this lies in the author's use of scientific data. This is no ordinary drawing book; its concern is not totally with a two-dimensional outcome. The author has enhanced the design problems by including scientific information that effectively explodes the artist's realm of participation with the object. The information acts as a lever to pry open the viewer's range and expose him or her to new perspectives and possibilities. This book gives the artist and the artistically-minded a new window onto the world of an arboretum.

We have all seen, held, and perhaps examined a leaf. But a drawing exercise designed around a leaf makes us focus our attention in a new way. Mr. Taylor structures his exercise in this manner:

"Is the character of a leaf in its color, in its shape, or in its veins? Which of these elements provides the most vivid evidence of the purpose of its existence?

I hope you will agree that the delicate system of veins, which carries water and oxygen and sugars and

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holds the leaf outstretched towards the sun, most dramatically expresses a natural function. It is a basic design, shaped like a tree, like a river delta, like lightning. It is bold and subtle, complex and simple, intricate as a maze and obvious as a page of squares. It is one of nature's most beautiful designs, and it is all for a purpose."

And later, to enhance the patient and detailed examination the author has requested one make:

"Now that we have examined the overall design of the veins, I would like you to look at the angles at which branchings occur. You will observe that the veins spreading out from the main trunk tend to form an angle of less than 90°. In fact, in many cases, this angle will be set at 45°. In very thin leaves it may be as little as 30°. In broad leaves, it may be 60°. This angle has to do with the relative thickness of these first branchings in comparison with the main trunk. The general rule is, the thicker the vein the smaller the angle, or the thinner the vein the larger the angle, so that the angle will almost always be 30° and 60°. If you observe the very smallest veins, you will see that the rule is applicable there and that nearly all of the very thin veins branch off at 90°. The angle is always a function of the thickness, and this rule, which has its basis in engineering and thermodynamics, provides both the variations and the consistencies of the overall design."

Through this discussion and further information on the dynamics of liquids in transport, the particularized function of the elements in a leaf are made clear and – at least for this reader – it is forever removed from the realm of a two-dimensional, haphazardly-patterned object. It is a functioning organic structure, and a drawing made with this kind of understanding carries a new kind of convincement.

Mr. Taylor's exercises on the design of an egg includes a discussion of the engineering inherent in the form, its specialized design to withstand the stresses eggs are heir to. Design problems on the structure of seed pods are illuminated by a discussion of the specialized protection and transport mechanisms each plant has evolved.

The molded counterpoint of the scientific and artistic points of view in *Design Lessons From Nature* creates an exciting workbook. For this artist it offers a new and fascinating path through the mingled disciplines.

Susan B. Blum

MORRIS ARBORETUM

SEPTEMBER 1975 BULLETIN 26 (3)

PLANT TREASURES of FAIRMOUNT PARK

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THE MORRIS ARBORETUM BULLETIN
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COVER: *Betula maximowicziana*, the monarch birch, one of the trees discussed in "Plant Treasures of Fairmount Park," page 40. Photo by Gary Koller.

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The **Wonderful World of Plants** *of Southern California*

THE LAURA L. BARNES LECTURE FOR 1975

by Mildred E. Mathias, Ph.D.
Emeritus Professor of Botany and Past Director
Botanical Gardens-Herbarium,
University of California, Los Angeles

The rich native flora of California has been an attraction to plant explorers and the source of many early ornamental plant introductions to Europe. Some have naturalized abroad, many are still popular in horticulture. The Matilija poppy (*Romneya coulteri*), flannel bush (*Fremontodendron* spp.), *Carpenteria californica*, baby blue eyes (*Nemophila* spp.), the godetias (*Clarkia* spp.), meadow foam (*Limnanthes* spp.), and the California poppy (*Eschscholtzia californica*) are perhaps better known abroad than in their native home. Monterey pine (*Pinus radiata*) is an important timber tree in many parts of the world as well as an occasional ornamental. The redwood (*Sequoia sempervirens*), Sierra big tree (*Sequoiadendron giganteum*), and incense cedar (*Calocedrus decurrens*) are all well-known ornamental trees native to California.

The 6500 to 7500 species of higher plants known in the state, of which some 30% are endemic, reflect the great diversity of plant habitats. California has a north-south range of over 10° latitude (about 1100 miles), elevations from almost 300 feet below sea-level to over 14,000 feet within a relatively short air-line distance, rainfall varying from over 100 inches annually in the northwest to almost none in parts of the southern deserts, temperatures from 134°F to unknown lows in the high mountains, and a wide variety of soils.

The gardener in California has the possibility of cultivating not only the native plants but also a myriad of introductions, limited only by availability of novelties and the microclimate of the garden. Even the latter can be modified by the use of containers, lath and glass shelters.

The mild coastal areas of southern California with a Mediterranean type climate of cool winter rains and many long dry warm to hot months provide garden conditions particularly suited for introductions from those parts of the world with a similar climate. Thus it is not surprising to find the ornamental flora of southern California rich with introductions from Australia, Chile, South Africa and the Mediterranean. Italian stone pine (*Pinus pinea*), Atlas cedar (*Cedrus*

atlantica) and carob (*Ceratonia siliqua*) from the Mediterranean provide a background for Australian acacias and pittosporums, the South African natal plum (*Carissa macrocarpa*), aloes and many members of the iris family, *Escallonia*, *Alstroemeria*, and the spectacular *Puya* species of Chile. This collection of exotics will thrive alongside the native sycamore, *Platanus racemosa*, and surprisingly the same garden may contain familiar plants of more temperate origin — camellias, wistaria, chrysanthemums and roses — as well as the tropical and subtropical gingers (*Hedychium* and *Alpinia* species), coral trees, bougainvillea, and an assortment of palms.

Hundreds of ornamental plants have been introduced into southern California during the past two centuries, some to become so well accepted that every nursery can supply them. Oleanders (*Nerium oleander*), ivys (*Hedera* spp.), hollys (*Ilex* spp.), and natal plums (*Carissa macrocarpa*), are examples of plants that are so useful in the garden that a variety of named cultivars are available.

But other plants have been lost to the trade. Many introductions into the California ornamental flora did not succeed for a variety of reasons. The seedlings may have become root-bound before being planted out; they may have been planted in the wrong soils, or wrong climate; or they may have suffered from neglect. Many should be reintroduced. Old introductions that did not survive or are now rare in cultivation include *Acrocarpus fraxinifolius* from India (1900 to Santa Barbara), *Russellia equisetiformis* from Mexico (1873 to Santa Barbara), and *Genista aethnensis* from Sicily. Others have persisted, although more often in collections than in the nursery trade. They include the handflower tree of Guatemala (*Chiranthodendron pentadactylon*, 1908), *Dais cotinifolia* (from South Africa, 1900), weeping pittosporum (*Pittosporum phillyraeoides*, pre-1900 from Australia), and snow-in-summer (*Melaleuca linariifolia*, from Australia, 1871).

Modern city living has given an impetus to container gardening and the variety of plants useful for containers is both almost unlimited and untried. Containers can be fixed or movable for year-round variety. A tub or shallow bowl of calendula, marigolds or petunias can be as exciting as a rare plant display. Succulents, palms, aroids, orchids, bromeliads and bulbs are all appropriate container plants. The

. . . The diverse plant climates of southern California offer almost unlimited opportunities of growing ornamental plants from the far corners of the world.

ABOVE: *Erythrina coralloides* (Coral Tree), one of a group of introduced species. The genus has been selected as the official flowering tree for the city of Los Angeles. Photo by Ralph D. Cornell. RIGHT: Display of container plants at a southern California nursery. Photo courtesy Mildred E. Mathias.

succulent *Adenium* species of Africa, the unusual *Corokia* of New Zealand, *Mandevilla* 'Alice duPont,' and the many gesneriads are suggestions for the adventurous gardener.

New dwarf shrubs and less rampant vines and sprawlers are useful for the urban landscape. Dwarf *Arbutus unedo* (strawberry tree), the new *Tecomaria capensis* cultivars (Cape honeysuckle), dwarf oleanders, carissas and xylosma are important and valuable introductions.

In a region where lawns are a problem because of water requirements drought resistant ground covers are popular. Among these the ice plants and other succulents are favorites and many species and cultivars are available in the trade. The South African daisies, *Dimorphotheca*, *Arctotheca calendula*, *Osteospermum* and *Gazania* cultivars are colorful and popular ground covers along with trailing lantana (*Lantana montevidensis*) and ivy geranium (*Pelargonium peltatum*).

The diverse plant climates of southern California offer almost unlimited opportunities for growing ornamental plants from the far corners of the world. Plants native to similar Mediterranean climates where rain falls in the cool season have the best potential for success. But many tropical and subtropical plants have succeeded in the garden and others should be tried. The adventurous gardener can add to the original introductions of the early missions and the overland travellers of the gold rush days. The many plants offered in the halcyon years of the Southern California Acclimatizing Association and the great nurseries of Kate Sessions in San Diego, Orpet in Santa Barbara, and Hugh Evans, the Howards and others in Los Angeles should be reintroduced and tested for garden use. The plant introduction programs of arboreta and botanical gardens should be supported. New ornamentals from Mexico are being tested by Huntington Gardens; the several gardens of the Los Angeles County Department of Arboreta and Botanic Gardens are selecting and displaying ornamental plants from many parts of the world; Santa Barbara and Rancho Santa Ana Botanical Gardens are developing garden selections of our native flora. A new era of ornamental horticulture is a challenge for the southern California gardener.

shrub profiles

PHOTINIA VILLOSA

ORIENTAL PHOTINIA

Frederick H. Ray

There are 40 species of Photinia; however, they are not commonly planted in the north. *Photinia villosa* is the only truly hardy one of the three popular species. Its hardiness is listed as Zone 4 on the Arnold Arboretum's hardiness map. Oriental photinia is native to Japan, Korea, and China, and was introduced in 1865.

Photinia is a member of the rose family and at one time was thought to be a Crataegus. In fact one of the common names of *P. villosa* is Chinese hawthorn.

Christmasberry, another popular name, refers to the persistant red drupes appearing in the fall. These red fruits are a result of corymbose clusters of white, hawthorn-like flowers produced in May whose dense clusters on graceful branches bring to mind *Spirea* x *vanhouttei.*

The name *Photinia* refers to the shiny leaves. The evergreen species have more lustrous leaves than *P. villosa.* The term *villosa* refers to the soft, hairy undersides of the leaves.

Various authors have attempted to deseribe what this writer eonsiders to be one of the oriental Photinia's best characteristies, its fall eolor. This eolor must vary because it has been listed as yellow or red, red to bronze, searlet or deep red, and scarlet and gold. Perhaps the eolor is the result of exposure—a sunny position is best. Perehance it is a matter of soil types—reeommendations call for a light, sandy loam with leaf mold for best results. It does not thrive on basie soils. Could it be the weather?—better find out first hand this autumn.

Little care is required, but sometimes the shrub is susceptible to fireblight, a bacterial disease common to the Rosaceae family.

Fifteen feet is a typical height, but oriental photinia's ultimate size has been listed (Robinson) to as much as 20 to 30 feet high by 15 to 20 feet wide.

One aspect I have never seen any reference to is the unusual forms created by the upper branches curving skyward. This characteristic is especially noticeable in the fall when the flame-colored branches are silhouetted against the blue sky.

The short, dark-gray trunk is attractive when the plant is used as a specimen plant or in a shrub border. It may also be used as a hedge and would make an interesting free-form espalier.

The evergreen species found occasionally in the area is *P. serrulata.* Its sawtoothed leaves may be windburned in unprotected locations. In March, the new reddish growth is much like that of *Pieris japonica*, which sets it apart from many evergreen shrubs at that time of the year. The attractive new leaves are followed by the unusual smelling white flowers in May, giving rise to red fruits in the fall.

P. x *Fraseri*, a cross between *P. serrulata* and *P. glabra*, is proving popular in the South and is now seen more often in the Philadelphia area. This hybrid is known for its coppery-red, new growth. Several new cultivars of this hybrid, all showing new red growth, are: 'Red Robin', 'Birmingham', and 'Robusta'. 'Robusta', originating in Australia, is reported (Hillier) to be one of the hardiest of *P.* x *Fraseri.* These shrubs make attractive espaliers.

There are five plantings of oriental photinia at Temple's Ambler Campus, three of these in the formal perennial garden. At the Morris Arboretum plantings of *P. villosa* can be seen near the Heather Garden; *P.* x *Fraseri* was newly planted this spring at the west corner of Gates Hall.

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Rick Ray, B.S. from North Carolina State University and M.S. from Virginia Polytechnical Institute and State University, teaches plant identification and ornamental horticulture at Temple University's Ambler School of Horticulture.

LEFT: *Photinia villosa* **on the Johnson Estate in Villanova, Pa. The ornamental quality of the leafy branches can be seen in this example. Photo by F. H. Ray. ABOVE:** *Photinia villosa* **v.** *maximowicziana* **in fruit at the Morris Arboretum.**

NOTES ON *BERBERIS GLADWYNENSIS*

Miss Josephine deN. Henry, president of the Henry Foundation for Botanical Research, Gladwyne, Pa., corrects our Shrub Profile of December, 1974, Vol. 25, No. 4. It was Mrs. J. Norman Henry, referred to ambiguously as Ms. Henry in the article, who noticed the chance hybrid between *Berberis verruculosa* and *B. julianae.* Mrs. J. Norman Henry (Mary G.) was mother of Miss Josephine Henry, and it was Mrs. Henry who gave this plant to Dr. Edgar Anderson of the Missouri Botanical Garden for description and subsequently gave the right to propagate it to Dr. J. Franklin Styer who named the clone 'William Penn'. We thank Miss Josephine Henry for her clarification. *Editor*

Plant Treasures of Fairmount Park

By Gary Koller and Susan Blum

The Centennial Exhibition site is the richest horticultural area in the 4079 acres of Fairmount Park; the locale contains many trees and shrubs considered to be outstanding or rare specimens. Personal inspection of the nine trees here discussed should provide inspiration to the gardener and planner. They are all found within an area bounded on the east and west by Montgomery Drive and Belmont Avenue, to the north by South George's Hill Drive, to the south by the Japanese Exhibition House and the drive proceeding east of it.

During or prior to the Centennial Exhibition, the Horticultural Hall area was profusely planted with native and exotic trees and shrubs. Many were new to cultivation in 1876, and their planting in Philadelphia was experimental.

Five of the nine trees included in this article were mentioned in "A Catalogue of Trees and Shrubs Introduced in the Horticultural Gardens Adjacent to Horticultural Hall", a list of 630 plants compiled in 1880 by botanist and, later, Pennsylvania's greatest protagonist of forestry conservation, Joseph Rothrock. Four of the five trees are estimated to be actual Centennial plantings.

The nine trees selected are 1) uncommon in the Philadelphia area; 2) exhibit from their Fairmount Park instance, as well as from other sources, that they are hardy, vigorous species in our area; 3) have horticultural features that could fill specific or problematic planting requirements; 4) are relatively problem free, easy of growth and low in maintenance requirements.

Interest in trees for the urban landscape, as well as for highway and streetside plantings, has greatly increased in the last decade; however, knowledge of the qualities, performance and adaptability of trees in an urban setting has been limited to a relatively few species. The range of choice could be expanded through the dissemination of knowledge already extant, or through the testing of new species under urban conditions. Several of the trees in this Fair-

Centennial Exhibition site in Fairmount Park, Philadelphia, Pa. The trees discussed in the following article are here located: 1. *Kalopanax pictus*; 2. *Torreya nucifera*; 3. *Torreya californica*; 4. *Gingko biloba* 'Fairmount'; 5. *Acer pseudoplatanus* 'Variegatum'; 6. *Quercus dentata;* 7. *Quercus nigra;* 8. *Betula maximowicziana;* 9. *Pinus armandi*. Drawing by Susan Blum.

mount Park sampling are known to have specific urban recommendations, but are little used. Another of the trees is already being tested for its urban aptitude.

Kalopanax pictus is one of a selection of ten trees being tested by the Morris Arboretum under a National Park Service grant for use in high impact city park settings. The tree is not widely known or planted, but seems to have the qualities necessary for performance in a complicated urban environment.

We hope that the individual gardener might find a tree suitable to his or her unique horticultural needs. To that end, a partial listing of purchasing resources follows this article. The taking of cuttings or seeds from the Fairmount Park specimens is prohibited; but those trees not available from the nursery trade may, from time to time, become available through institutional plant distribution. For example, the Morris Arboretum hopes to distribute *Torreya californica* at its spring '76 plant-distribution-to-members.

Of value for its detailed treatment of the woody species in Fairmount Park (including maps which locate and identify individual trees) was the study, *Natural Resource Inventory and Management Interpretation of Fairmount Park, Philadelphia, Pa., Prepared For the Philadelphia 1976 Bicentennial Corporation,* 1971, by Jack McCormick and Associates, Devon, Pa. Specifically used for this article was the section, "Ornamental Woody Plants of the Centennial Exhibition Site, West Fairmount Park," authored by Mary Ellen MacDonald, Tyler Arboretum, Lima, Pa.

Assistance in researching and compiling the information for this article was provided by Dr. John C. Swartley, author of "The Big Trees of Southeastern Pennsylvania", *Morris Arboretum Bulletin* 21 (2), and Rick Ray, instructor of plant identification and ornamental horticulture at the Ambler School of Horticulture of Temple University.

Kalopanax pictus. **Photo by Gary Koller.**

1. *Kalopanax pictus* **(Thunb.) Nakai**
CASTOR-ARALIA

Height: 47 feet. Spread: 75 feet. Diameter at breast height: 32 inches.

The *Kalopanax pictus* in Fairmount Park is one of the finest specimens of its type in the United States, and one of the few fruiting ones. It is a handsome tree. The rounded open crown begins some 12 to 15 feet from the ground and the large foliage cast an expansive, light-speckled shade. The trunk branches some three feet from the base, with large secondary limbs spreading broadly upward. The bark is dark brown and deeply furrowed in a honeycomb pattern. Large leaves, 6½ inches long and up to 5½ inches across, hang from petioles nearly twice their length; the five lobes converge to long, pointed, serrate-edge tips. Dark green above, leaves are covered with a soft, yellow pubescence beneath.

Terminal clusters of small, creamy white flowers appear on the Kalopanax in late July, providing an ornamental display during mid-summer's constant green. Clusters of black seeds replace the flowers. Seeds mature in the first year but need the weathering of two years in order to germinate. The tree is readily propagated from the prepared seeds.

Rehder (Alfred Rehder in *Manual of Cultivated Trees and Shrubs*) comments that Kalopanax has a striking sub-tropical appearance, a reference possibly to the large, bold scale of the leaves, trunk and bark pattern. Despite the allusion to warmer climes, the tree's hardiness ranges well north of this Philadelphia instance.

Kalopanax pictus is the only species of the genus Kalopanax of the family, Araliaceae. The tree comes from eastern Asia, in a range that includes China, Korea, Manchuria and Japan and was introduced into cultivation in 1865. Its name derives from the Greek, *kalos*, meaning handsome and *panax*, referring to the stout prickles which line the branches. These thorns become less evident with age, but can still be seen on the trunks of older specimens.

Kalopanax is difficult to find in the nursery trade; the tree is little known and little used despite its many fine qualities. The Morris Arboretum, in a program sponsored by the U.S. Park Service, is testing *Kalopanax pictus* for use in urban parks. Seeds and cuttings for experiment and evaluation were obtained from the Fairmount Park Tree.

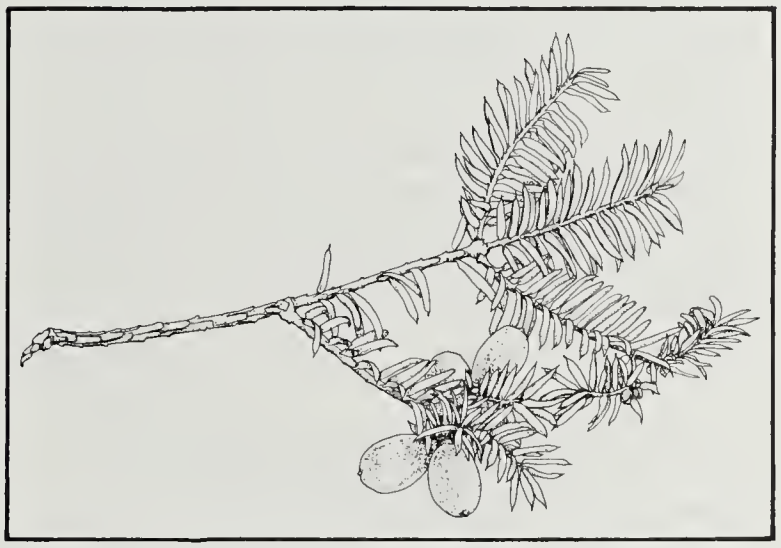
2. *Torreya nucifera* **(L.) Sieb. and Zucc.**
JAPANESE TORREYA

Height: 35 feet. Spread: 25 feet. Diameter at 10 inches base height: 40 inches

The 1880 catalogue of Centennial plantings says of *Torreya nucifera*: "Nutmeg bearing Torreya. From Northern Japan where it becomes a good-sized tree.

Not much tested here."

Since then the Japanese torreya has been found to do well in the Philadelphia area when provided with full sun and some protection from strong winter winds. The Fairmount Park planting is one of the largest specimens locally and its prolific fruit bespeaks a robust acclimation.



Torreya nucifera, **leaves and fruit. Drawing by Susan Blum.**

Branched to the ground, this torreya looks more like a large shrub than a tree. Five trunks at ground level are resolved to two main stems on the upper tree. The foliage is thin in density and the many light green fruits stand out decoratively from the dark green foliage background. The bark of *Torreya nucifera* is greyish brown and flaky. Branches spread widely and are whorled about the trunk. The one inch needles with sharply pointed tips are two-ranked on the branchlet, each needle a lustrous dark green above and striped beneath with a double white stomatal band.

Torreya is sexually dioecious; female plants bear the fleshy, pale green, one inch long fruit which ripens in the second season. Rehder comments that the fruit is edible and, though not tasted by the authors, its fragrance was fresh and pungent.

Torreya nucifera is a native of Japan and was first described by Linnaeus in 1753. His name, *Taxus nucifera*, points up the tree's close relationship to the common yew. Remaining a member of the Taxaceae family, the plant was renamed in honor of John Torrey, distinguished nineteenth century American botanist.

The Japanese torreya is no longer rare in the Philadelphia area, but it is not as widely used as its hardiness and suitability for specimen evergreen planting or tall hedge would recommend. It is easily propagated by cuttings taken in November.

3. *Torreya californica* Torr.
CALIFORNIA NUTMEG

Height: 20 feet. Spread: 28 feet. Diameter at ground level: 23½ inches

Again, from the 1880 catalogue of Centennial plantings: "Torreya californica. 'Stinking yew.' A tree from the California Sierras, 20 to 40 feet high. Foliage is beautiful and bark is little like that of an ordinary conifer."

Indeed, there are many beautiful and unique qualities to the California Nutmeg; its form is but one. The trunk of the Fairmount specimen is very sinuous, dividing at two and a half feet to two main stems which at four feet spread parallel to the ground. Some branchings rise to the twenty foot height, others droop back to ground level to create an umbrella-like effect. All branches have a twisting pattern and tend to return to the horizontal. The foliage has a bushy texture and, while soft and luxuriant in appearance, the needles are rigid and sharply pointed. New growth is a bright healthy green, older foliage slightly darker.

The needles of the California torreya are two inches long with a double white stomatal line beneath. The pear-shaped fruit ranges one and a half to two inches long, pale green with a glaucous coating; in maturity it will be striped with purple.

Torreya californica, **leaves and fruit. Drawing by Susan Blum.**

Torreya californica is little grown this far north, but the Fairmount Park planting, in a healthy state in advanced age, recommends greater horticultural usage in our area. Its slow growth, small scale, and relative freedom from insects and disease suggest it as a low-maintenance landscape plant—in an evergreen screen or shrub border or as a specimen plant of great interest. It is easily propagated by cuttings.

Gingko biloba L. 'Fairmount'. Photo by Gary Koller.

4. *Gingko biloba* L. 'Fairmount'
FAIRMOUNT or SENTRY GINGKO

Height: 55 feet. Spread: 20 feet. Diameter breast height: 30 inches.

The gingko is a well-known tree to the city dweller. Its fan-shaped leaf, rich yellow fall color and plumey branches mark many a street, and its pollution and salt resistance have made it a faithful urban companion. The gingko is highly tolerant of a wide range of soil types and is virtually insect and disease free. Slow growth, ease of transplant and long life increase the species's congeniality to man, and as a street tree its strong branches are little affected by wind and ice storms.

The Fairmount gingko is a cultivar of this popular tree. Developed in the Fairmount Park nurseries almost a century ago, it was selected from seedlings for its upright and compact habit. The form has been maintained in the nursery trade by grafting a shoot from the cultivar onto seedling root stock of the species. This ensures its fastigiate habit and male character and eliminates the chance of the ill-smelling fruits which female trees produces.

The tree in Fairmount Park is the original plant of the cultivar. Undoubtedly a Centennial planting, the tree marks a corner of the old Horticultural Hall site. A cluster of tight, compact branches begins some five feet from the base, its crown becoming a tall, narrow, pyramidal shape. Leaves are a darker green than the common gingko, its bark the same striated gray. While retaining all the virtues of the common gingko, the sentry gingko's arrow-straight silhouette recommends it where compact plantings are desired.

5. *Acer pseudoplatanus* L. 'Variegatum' West.
VARIEGATED SYCAMORE MAPLE

Height: 35 feet. Spread: 30 feet. Diameter breast height: 18½ inches.

The total effect of this slow-growing tree is unusual and pleasing. Its distinction lies mainly in the interestingly patterned leaf and the multi-colored, exfoliating bark.

The Fairmount Park planting, further along the walk way from the sentry gingko, is one of the larger specimens of the maple cultivar in the Philadelphia area. The trunk rises five feet before branching, spreading ultimately to the rounded crown one identifies with maple. Leaves are splattered with

Leaves of the variegated sycamore maple. Photo by Gary Koller.

minute dottings of very pale and very dark green; each is different in pattern but combine to give the foliage crown an airy, light-speckled effect.

The bark exfoliates in one inch patches, the older grey bark peeling off to expose a brick red color which softens in time to a sandy hue. The color patterns in the bark are an excellent compliment to the diffusely patterned leaves.

Though delicate in appearance, the variegated sycamore maple is a vigorous tree. It is widely used in England where strong winds spray it with ocean water; this high salt tolerance recommends it for use in shore areas and for streetside plantings. It is an excellent shade tree but lacks the autumn color of the sugar and Norway maple. The variegated sycamore maple is insect and disease free, easy to grow and transplant. It may be propagated by budding or grafting the cultivar onto a seedling of *Acer pseudoplatanus.*

6. *Quercus dentata* Thunb.
DAIMYO OAK

Height: 47 feet. Spread: 40 feet. Diameter breast height: 36 inches.

Quercus dentata is listed in the 1880 catalogue of Centennial plantings, and this specimen is likely its representative. The slow-growing Daimyo oak is not much planted in our area, and when found is usually of a much smaller size than this example.

The oak stands by the side of South George's Hill Drive, flattened on one side by its proximity to an apple tree. The most prominent feature of this tree is its bold appearance, a factor accounted for mainly by the very large leaf and the manner in which this leaf is distributed on the limb.

Branching of the park specimen of the Daimyo oak begins at seven to eight feet from the base. Limbs have a strong upward angle and taper slowly in their outward reach. Branchings are sparse except at the tips. The crown is pyramidal, due to crowding; in another setting a rounded crown might be expected.

The bold, leathery leaves are as much as ten inches long, six to eight inches broad. They are carried in short-branched bundles very close to the limb. The shallow-lobed, spatular-shaped foliage is light green on the coarse upper surface. Beneath it is grey-green and densely hairy with very prominent veining. While there is evidence of leaf damage from chewing insects, the tree is in general good health. A companion tree of the same species, however, is in a state of advanced deterioration. Neither tree is producing fruit.

The tree bears no sign of grafting, the manner by which the Daimyo oak was early propagated. A native of Japan, Korea, and northern and western China, *Quercus dentata* was introduced to western cultivation in 1830. Its hardiness ranges somewhat north of us. It deserves more attention as a specimen plant of modest stature and coarse, unusual appearance. It is easily propagated from seed.

7. *Quercus nigra* L.
WATER OAK

Height: 35 feet. Spread: 30 feet. Diameter breast height: 32 inches.

Quercus nigra, listed among the Centennial plantings, can be found in a swampy meadow beside a small stream. Atypical of the species, this specimen of water oak is branched to the ground, its shape an almost total round. Its foliage texture is dense and small, its color an even dark green.

The water oak branches in a pattern similar to the common pin oak: limbs are whorled around the trunk, lower branches pendulous, mid-branches horizontal, top branches angling upwards. The foliage is carried in groups of five to seven leaves on two inch branchlets. The four inch long, narrow leaf is a glossy dark green on the upper side with one to three shallow

Quercus nigra. **Photo by Gary Koller.**

lobes at the tip. The underside is a dull green with tufts of brown hair at the juncture of the veins. Developing acorns were in evidence on the branchlets.

Native to the United States from Delaware to Florida and west to Kentucky and Texas, *Quercus nigra* is known to be hardy in our area. It grows equally well in damp or dry, gravelly soils. Trees which will tolerate wet feet are rare, and the water oak might well provide a finely textured, handsome answer for a gardener's problem area.

8. *Betula maximowicziana* Reg.
MONARCH BIRCH

Height: 45 feet. Spread: 40 feet. Diameter at base height: 46 inches.

See cover for illustration.

This tree is a giant of graceful habit and delicate coloration. The main trunk branches at three feet from the ground, its large lower limbs spreading widely. The broad dome-shaped crown begins at four feet and permits a subtle shade throughout. Bark is a white-grey with darker linear markings, the white branches visible in and out of the pale-colored foliage.

Its simple leaves are three to four inches long, light green above, paler beneath, smooth on both surfaces. Leaf edges are serrate and, hanging among the leaves in early July were numerous, two inch long, yellow-green catkins.

The monarch birch comes with some horticultural cautions. It belongs to a category known as "bleeders," so any pruning should be done after the major spring sap run. It is also susceptible to borers.

But despite the two-mentioned drawbacks, the monarch birch is entirely hardy in this area and seems to do well even in poor, dry soils. It would provide a handsome object in the landscape through all seasons, its bark providing special winter interest. The monarch birch can be propagated from seed.

9. *Pinus armandi* Franch.
ARMAND PINE

Height: 25 feet. Spread: 20 feet. Diameter at breast height: 8 inches.

Pinus armandi is located in a stand of evergreens on South George's Hill Drive, its rich, bushy foliage showing bright green in the filtered sunlight. The habit of the pine in this site is broadened by its untypical double trunk, caused most likely by early damage to the terminal growing point. Branching is pronouncedly horizontal. Needles of the soft pine are held on the upper hemisphere of the limbs, a factor which increases the striated, cloud-like appearance of the dense foliage. Die-back in the original whorled branching pattern has given the tree an interesting assymetrical shape.

The leaves are 3½ to 6 inches long and carried in bundles of five. Their bright green surface is contrasted by a gray-green underside. Cones four to eight inches long were sighted on the upper portion of the tree.

The armand pine was discovered by missionary-botanist, Père Armand David, and introduced in 1895 to France. The pine is widely distributed in the mountains of western China where it is usually found in rocky places, rarely forming pure forests.

The armand pine bears a strong resemblance to the white pine (*Pinus strobus*), though the plant's stature is much smaller. It deserves wider use where scale and proportion of the mature plant are of concern. It can be propagated by seed.

The armand pine. Photo by Gary Koller.

FROM THE BROOKLYN BOTANIC GARDEN PUBLICATION

"1200 TREES AND SHRUBS– WHERE TO BUY THEM"

Kalopanax pictus

LaFayette Home Nursery, Box 148, Rte. 17, LaFayette, Illinois 61449. Will ship retail.

Lafkins Garden Center, Mamaroneck Ave. at Rosedale, White Plains, New York 10603. Local retail.

Torreya nucifera

Joel W. Spingarn, 1535 Forest Ave. Baldwin, New York 11510. Ships retail.

Gingko biloba 'Fastigiata'

Dauber's Nurseries, 1705 N. George St., Box 1746, York, Pa. Retail. Catalog.

Quercus nigra

Gilmore Plant and Bulb Co., Box 8, Rte. 421, Julian, N.C. 27283. Retail. Catalog.

Pinus armandii

Raraflora, Fred W. Bergman, 1195 Stump Rd., Feasterville, Pa. 19047. Retail.

●

ANNOUNCING A RE-ISSUE OF

THE FERN GUIDE

NORTHEASTERN AND MIDLAND UNITED STATES AND ADJACENT CANADA

By Edgar T. Wherry

The Morris Arboretum of the University of Pennsylvania, 1972.

Copies available through the Morris Arboretum 9414 Meadowbrook Ave., Phila., Pa. 19118.

●

. . . and a note of congratulations to Dr. Edgar T. Wherry on the event of his ninetieth birthday, September 14, 1975.

books

A GUIDE TO NATURAL COSMETICS. Connie Krochmal. Quadrangle; The New York Times Book Company, New York. 1973. $8.95.

A GUIDE TO THE MEDICINAL PLANTS OF THE UNITED STATES. Arnold and Connie Krochmal. Quadrangle; The New York Times Book Company, New York. 1973. $12.50. Paperback edition, 1975. $4.95.

A NATURALIST'S GUIDE TO COOKING WITH WILD PLANTS. Connie and Arnold Krochmal. Quadrangle; The New York Times Book Company, New York. 1974. $10.95.

Arnold and Connie Krochmal have been writing about the uses of native plants for some time. Now they have gone all out and given us three books on medicinal, food and cosmetic plants. They are not only dedicated to this task, they are well qualified. Dr. Krochmal has worked in horticulture in Honduras and Afghanistan and is now with the United States Forest Service and the North Carolina State University. His wife was raised on a farm in Appalachia, where everyone is close to wild plants, and is now Extension Lecturer at the North Carolina Botanical Garden.

A Naturalist's Guide to Cooking with Wild Plants has an excellent introduction to the subject. About 100 species of plants are discussed – a general account, the part or parts eaten, and from one to a dozen recipes for their preparation. The authors cite some 20 books and Department of Agriculture publications.

A Guide to the Medicinal Plants of the United States contains a good general introduction, a historical background, information on halucinogens, plant identification, drug plant and synthetic sources, plus instructions for growing drug plants, – and cautions!

A Guide to Natural Cosmetics was written by Mrs. Krochmal alone. Again, the extensive introduction is good reading. Some funny things show up in the attempt of humans to improve their appearance – and not just the women! The specific recipes are grouped under various uses, such as astringents, cold creams, toothpastes, face, nail, hair and shaving preparations. Then the animal, vegetable and mineral components are discussed. Fifteen books on the subject are cited.

J. J. Willaman

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STATES AND ADJACENT CANADA

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MORRIS ARBORETUM

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From Russia...

an historic botanical exchange

THE MORRIS ARBORETUM OF THE UNIVERSITY OF PENNSYLVANIA

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THE MORRIS ARBORETUM BULLETIN

Volume 26 Number 4 December, 1975

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EDITOR: Hui-Lin Li ASSISTANT EDITOR: Susan B. Blum

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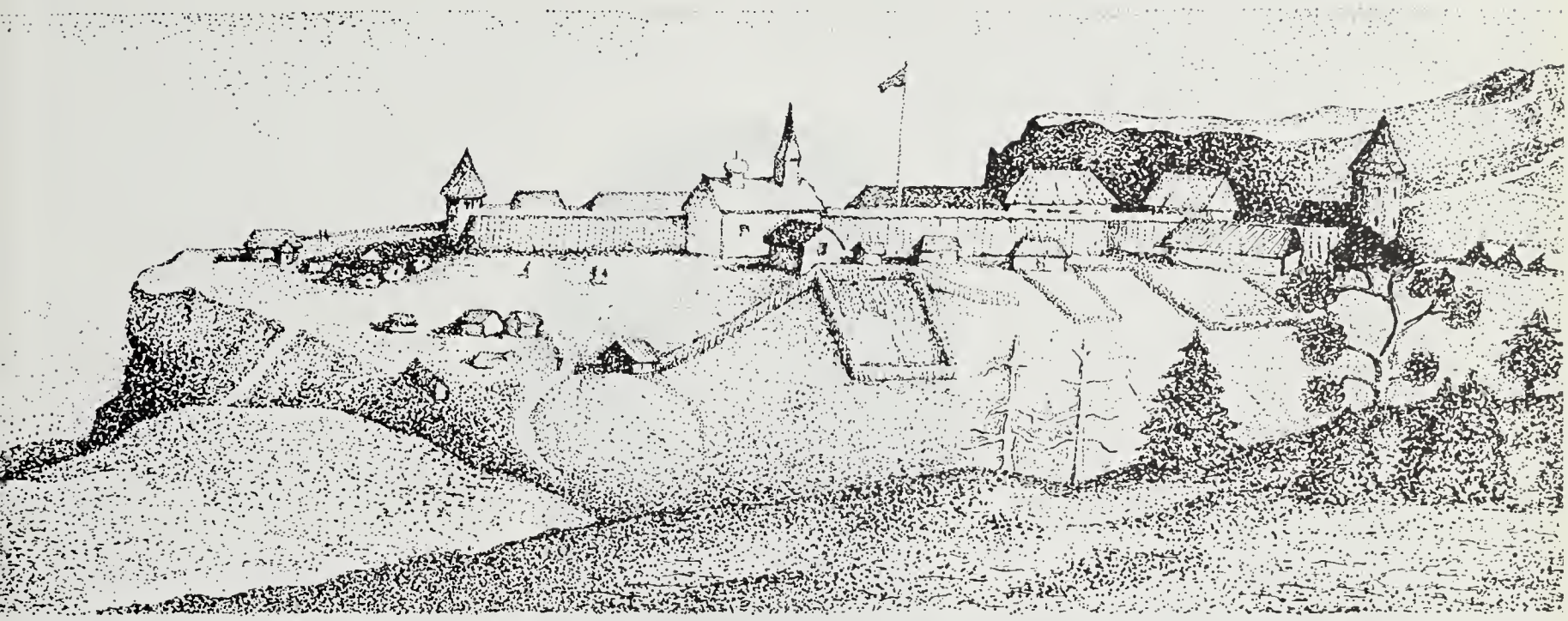
Russo-United States



Botanical Exchange in 1841

SOME MATERIAL EVIDENCE

by Hui-Lin Li and Ann F. Stanley

This is an aceount of some doeuments and specimens, unexpectedly discovered, which relate to botanical activities in the year 1841. These actual materials serve to fill a page in American botanieal history hitherto little known or substantiated.

The historical baekground into which these pieees of information fall deserves a brief sketeh. The several large eities of the northeastern seaboard of the United States eonstituted the major eultural centers of the hemisphere during the 1830's and 40's. As with most cultural endeavors of the time, American botanieal aetivities were largely confined to these big eities. Botanical studies of the period were mainly taxonomic – the identification, naming and elassifieation of plants. Exehange of seeds and speeimens with forcign lands was pursued, and the era saw the beginnings of Ameriean botanical gardens and herbaria.

By 1840 the vast American continent had still not loosed all her seercts and botanists were active members of most continental explorations. Though many speeies still awaited diseovery, the eastern portion of the United States was fairly well-known botanieally. The land west of the Mississippi to the Pacifie Ocean, however, was a little known territory. (Botanical explorations west of the Mississippi during the early 19th Century were detailed by McKelvey (1955).)

In the 1840's, California was a mueh desired and disputed land. Initially under the Spanish, the territory later eame under Mexiean control. This did not, however, deter the Freneh, British, Russians and Amerieans from struggling to establish themselves in the area around San Francisco in the hopes of wresting California for themselves.

Russia had established a eolony at Fort Ross, a site north of Bodega Bay in Sonoma County adjacent to the San Francisco area. The colony endured from 1812 until 1841. Seeds and plant materials were colleeted and collated at this site and forwarded to the Imperial Botanieal Garden in St. Petersburg. And it is from St. Petersburg that word and sample of many new Ameriean plant speeies reached American botanists, having traveled a little less than around the globe. Although the United States and Russia were

---

Fort Ross at Bodega Bay, California. From a drawing in Duhaut-Cilly's *Voyage Autour du Monde*, Paris, 1835, reproduced in the Quarterly of the California Historical Society, 1933.

in keen competition in California, we find that there were activities of intellectual exchange between the two countries that amounted to detente.

The material with which this article deals consists of several packages of letters; contemporary pamphlets on botany, zoology and other subjects; and seed samples. The bundle was sent by Dr. F.E.L. von Fischer, Director of the St. Petersburg Imperial Botanical Garden, in the year 1841 and was addressed to two American botanists and two American societies. Bearer of the bundle on its trans-Atlantic journey was one William Chew, Secretary to the United States Legation at St. Petersburg.

The materials never reached their destinations for the lot went undelivered. The intact bundle reposed in storage at the Botany Department of the University of Pennsylvania, and was finally discovered several years ago at the Morris Arboretum. It is not known how this material came from Mr. Chew to the University, nor how, later, it was transported from the University to the Morris Arboretum. In the latter instance the package may have been transported to the Arboretum with other materials when the original botany building, MacFarland Hall, was torn down in the early 1960's. Or the materials could have been transferred as early as when the Morris site originally came under University administration in 1932. Efforts to ascertain any past history of this interesting material have so far been unsuccessful.

The material consists of four packages, each wrapped in parchment. Two are addressed separately to the American botanists, Dr. John Torrey of New York, and Dr. William Darlington of West Chester, Pa.; the remaining two are addressed to the Boston Society of Natural History and the Massachusetts Horticultural Society. The contents of the packages differ, and not without reason for the stature and activities of the recipients were not the same. An inventory of the packages is on page 55.

Dr. John Torrey (1796-1873), recipient designate of one of the packages, was the foremost American botanist of his time. Born in New York City, he received his M.D. degree in 1818 from the College of Physicians and Surgeons (New York). He practiced his profession remittingly while devoting considerable time to his interest in botany. He was later made Professor of Botany and Chemistry at Columbia College, New York, and it was to this institution that he presented his herbarium comprising some fifty thousand sheets, an outstanding collection containing many type specimens.

William Darlington

Torrey received plants from many sources both at home and abroad. The botanical collection of the important exploring expedition of northern California conducted in 1838 by Lt. Charles Wilkes of the United States Navy was divided between Dr. Torrey and Asa Gray of Harvard (Gray, 1873; Humphrey, 1961). Torrey's biographer, A.D. Rogers (1942), mentions that "From Professor Fischer of St. Petersburg, Russia, came 400 plants, chiefly from Siberia, many of which were new to Torrey". (Apparently other packages were more successful of delivery than our instance.)

John Torrey was memorized by George A. W. Arnott in 1840 by the naming of the genus *Torreya.* The species *Torreya taxifolia* Arnott was discovered in Florida in 1835 by Mr. Hardy B. Croom. Torrey ascertained that this represented a new type of coniferous tree. It was of this plant, *Torreya taxifolia*, that Fischer in his letter requested a sample. (See Letter I, page 54.) Subsequently Torrey himself named another species of the same genus, *Torreya californica* Torrey, this species from California. (Additional species of this interesting genus were known from Japan and China.)

The second recipient designate was William Darlington, 1782 - 1863. Darlington was born in Chester County, Pennsylvania, where he remained most of his life practicing medicine. He received his M.D. degree from the University of Pennsylvania in 1804. Darlington devoted his leisure time to the collection and study of plants and, though he cannot be considered a leader in the field, he was held in high esteem as a botanist. His published works in botany were few, but include the more well known *Flora Cestrica*, 1837. A pitcher plant, discovered in 1841 by W.D. Brackenridge, botanist of the Wilkes Expedition in northern California, was named *Darlingtonia* by Torrey in his honor (Harshberger, 1899; Hum-

phrey, 1961).

The sender of these packets was botanist-physician, Friedrich Ernst Ludwig von Fischer, born in Halberstadt, Germany, in 1782 and deceased in St. Petersburg, Russia, in 1854. Fischer was appointed by Emperor Alexander in 1823 to be the Director of the Imperial Botanical Garden at St. Petersburg. Under Fischer's tutelege the Garden was completely reorganized and greatly enriched. Fischer was the author of a number of botanical publications and named many new species either alone or with Carl (Karl) Anton Meyer, 1795 - 1855, another Russian botanist. Together Fischer and Meyer described many new species of plants discovered by Russian collectors in California.

The mutual friend of Fischer, Darlington and Torrey, and the man to whom Fischer entrusted this unsuccessful transaction, was William White Chew, descendant of the distinguished Chew family of Philadelphia. Son of Benjamin Chew, Jr., William was born in 1803 and died in 1856. He received an A.B. degree in 1820 and an A.M. degree in 1823, both from the University of Pennsylvania.

F. E. L. von Fischer

William W. Chew was a man of learning and many interests. His activities in politics include his membership on a committee in 1835 to make Germantown (now a part of Philadelphia County, but then a separate municipality) the state capitol instead of Harrisburg. In 1837 he was Secretary to the American Legation at St. Petersburg, and later was appointed Ambassador to Colombia, South America. It was upon Mr. Chew's return to the United States from Russia in approximately 1841 that Dr. Fischer requested the delivery of this group of botanical materials.

The Chew homestead, "Cliveden" in Germantown, is one of ten historical museums maintained by the National Trust for Historic Preservation in the United States. Preserved at "Cliveden" are paintings which William brought back from Constantinople and many cards of the royalty of the Russian court. Among the memorabilia are also portraits of William Chew, his seal, his furniture, and a leather trunk which may have been the very carrier of the packages in question.

The majority of William Chew's correspondence, also reposing at "Cliveden", has not been classified. Perhaps a search among his papers will reveal the reason for both his failure to deliver the material and its ultimate deposition at the University.

Russian contacts with American botanists were not limited to the several persons named above. Dr. Fischer conducted a very active exchange program with Asa Gray, 1810-1888, who became a professor of natural history at Harvard University in 1842.

Like most botanists of his time, Gray received an M.D. degree but never practiced medicine; his studies were in *materia medica.* Gray's interest in plants was greatly stimulated when he became an assistant in chemistry to Dr. John Torrey in 1833. Gray's contribution to botany as a teacher, and his important publications in floristics and phytogeography made him the leader of American botany of his time and a scholar of international stature (Humphrey, 1961).

It was Gray who supplanted Torrey as patriarch of American botany. As the emphasis shifted from man to man on the American scene, so too did the major attention of the botanists of the Old World. The Gray Herbarium Library of Harvard University contains a considerable amount of correspondence between Asa Gray and Dr. Fischer of Russia. The correspondence began in 1843, as Gray was not established at Harvard until 1842. This is the reason that, in 1841, Fischer sent his materials only to the Massachusetts Horticultural Society and the Boston Society of Natural History and not to Harvard; his contacts were not established with that institution as yet.

In a letter dated May 16, 1843, from Fischer to Asa Gray, Fischer stated that, ". . . Although our excellent friend Dr. Torrey has been very kind to me and sent some very valuable collections of N. American plants, the pride of my herbarium, I am nevertheless still poor in them if I look on your highly appreciated flora."*

* We are indebted to the Gray Herbarium, Harvard University for use of these archival materials.

Picture credit page 52: William Darlington, from *Botanists of Philadelphia* by J. W. Harshberger, Philadelphia, 1899.
Picture credit above: Frederich Ernst Ludwig von Fischer, Royal Botanic Gardens, Kew, England.

I. Letter to Dr. Torrey from Dr. Fischer

St. Petersburgh
April 12/24th 1841

My dear Sir,

You receive hereby the last catalogue of seeds, a parcel of seeds and a few specimens which I thought acceptable to you; these have been ready since last autumn and I could not dispatch them for want of a good opportunity; I shall anew prepare for you a collection with such species I did not send to you before, and I shall try to put together what I have to dispose of, of the flora of Kamchatka; I am sorry to say, that the plants of the Russian colony on the N.W. coast of America are a terra incognita to us, except the small number of species brought home by Hartweg and Eschscholtz; I hope to be able to join to the Kamchatka plants some other from Unalashka, which belong almost to the American flora.

Amongst the seeds you will find several species from Songaria, the district South from Siberia, in the meridian of Tomsk or Semipalatinsk; it is important to trust them directly to the soil, as soon as you receive the seeds, as they are subject to lose very soon their germinative power; this remark I refer chiefly, besides Rhododendron chrysanthum, to Rosa berberifolia and Ammodendron Sieversii; perhaps it may to be applied to Astragalus sieversianus. These plants have been collected by a botanist who is travelling in that part of Asia for the botanic garden, Dr. Schrenk; he found a good many of highly interesting plants, partly proving a link betwixt the flora of M. Altai and the Himalaya; I wrote you once, if I am right, that there are very curious coincidences of the Asiatic flora to the provinces on the South of the Caspian; there you find the Gleditschia caspica, Juglans regia and Pterocarya caucasica, and the Parrotia caspica, differing from Hamamelis only by the petals and so much resembling to common Hamamelis, when without flower, that you can hardly distinguish from each other; this is the ironwood of the inhabitants; a fourth coincidence is yield by the horse-chestnut, then by Planera. Of Parrotia poor Jacquemont has found a new species towards Kashmeer, less resembling Hamamelis, than the Caspian one.***

This parcel I forward to you by the favor of Mr. Camberleng, the Minister of the Union, who is indeed very kind as well as Mr. Chew who is Charge d'affaires till the Minister's arrival; if these gentlemen remain here, I shall be able to multiply my communications with you with great ease.

When you are kind enough to send me something of your production I shall be very much obliged to you. If you could spare me a specimen of Torreya, and a specimen of its wood too.

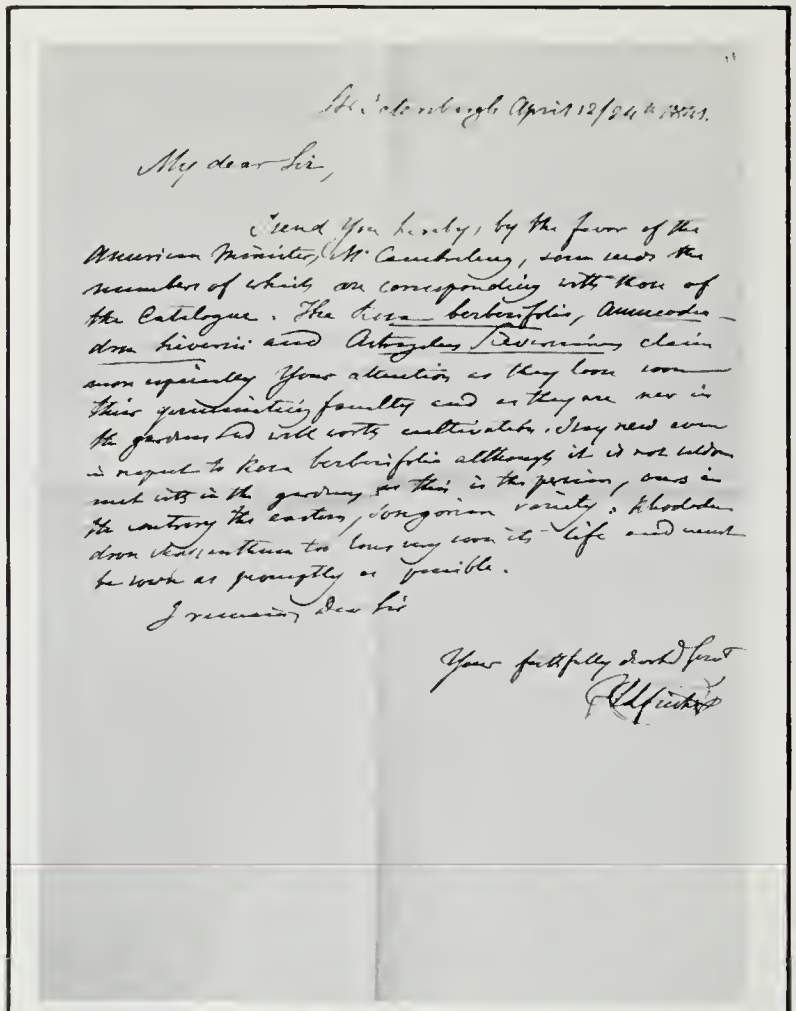
Your flora is here but in one copy, at the Academy of Science; we find always a little difficulty of procuring American books, but I hope to receive in a month or two your flora for the library of the garden; indeed it is vexing not to have it already at hand as I feel almost every day its want.

I remain, Dear Sir

Your faithfully devoted

FEL Fischer

* Apparently he means *Parrotia persica.*
** This is *Parrotia jacquemontiana* Decne.



St. Petersburgh April 12/24th 1841.

My dear Sir,

I send you hereby, by the favor of the American Minister Mr. Camberleng, some seeds the number of which are corresponding with those of the Catalogue. The Rosa berberifolia, Ammodendron Sieversii and Astragalus Sieversianus claim more especially your attention as they lose soon their germinating faculty and as they are new in the garden and well worth cultivation. I say new even in respect to Rosa berberifolia although it is not seldom met with in this garden as this is the Persian, ours in the contrary the eastern, Songarian variety. Rhododendron chrysanthum too loses very soon its life and must be sown as promptly as possible.

I remain, dear Sir

Your faithfully devoted Servt

FEL Fischer

II. First letter to Dr. Wm. Darlington

St. Petersburgh
April 12/24th 1841

My dear Sir,

I send you hereby, by the favor of the American Minister, Mr. Camberleng, some seeds the number of which are corresponding with those of the catalogue. The Rosa berberifolia, Ammodendron Sieversii and Astragalus Sieversianus claim more especially your attention as they lose soon their germinating faculty and as they are new in the garden and well worth cultivation. I say new even in respect to Rosa berberifolia although it is not seldom met with in this garden as this is the Persian, ours in the contrary the eastern, Songarian variety. Rhododendron chrysanthum too loses very soon its life and must be sown as promptly as possible.

I remain, Dear Sir

Your faithfully devoted servant

FEL Fischer

III. Second letter to Dr. Wm. Darlington

St. Petersburgh
May 31/June 12th 1841

My dear Sir,

I seize the departure of our mutual friend Mr. Wm. Chew, to send you a supplement to what he took charge of some weeks ago, consisting in some botanical papers and the Rev. D. Hohenacker's Florula Talyschensis, which contains a number of very interesting plants. I am but sorry that I have not all of them to offer to you; Dr. Hohenacker did not stay long enough in this country, and was obliged to promise to the Reiseserein of Esslingen the by far greater part of his collection in such a way that I get but a very limited number of specimens of the more valuable ones. Nevertheless if you will make a choice of which species you have not yet in your herbarium, I shall be happy to do what I can, to complete your collection in this respect.

I remain, Dear Sir

Your obliged servant,

FEL Fischer

IV. Letter to the Boston Society of Natural History

St. Petersburgh
May 31st/June 12th 1841

Gentlemen,

I have the honour to direct to the Society by favor of Mr. Wm. Chew, late Secretary to the Embassy of the United States at St. Petersburgh, a few memoirs I beg acceptance for the Society's Library.

I beg leave to assure again the Society of my entire readiness to render any service in this country in my power, in order to answer as well as I may be able to do, the purposes of the Society.

I am, Gentlemen, with true respect

Your most obedient servant

FEL Fischer
Director of the Imperial
Botanic Garden

To the Boston Soc. of Nt. History

V. Letter to Massachusetts Horticulture Society

St. Petersburgh
May 31st/June 12th 1841

Gentlemen,

I have the honour to beg acceptance of the collection of seeds hereby following: the No. 1 of the bags are relating to those of the Index seminum. I must observe, that the seeds of Rosa berberifolia, Ammodendron Sieversii, Rhododendron chrysanthum lose very quickly their germinating power and that it therefore will be adviceable, to sow them immediately after the arrival of this parcel, however advanced may be the season.

I remain with true respect

Your most obedient servant

FEL Fischer

An inventory of the materials sent as a single package by Dr. F.E.L. Fischer, Director of the Imperial Botanical Garden, St. Petersburg, Russia via William W. Chew to several American botanists and institutions in 1841.

1. Letters (in English) from Dr. F.E.L. von Fischer addressed to
   Dr. John Torrey, Professor of Chemistry and Botany, College of Physicians and Surgeons, New York, dated 12/24/1841.
   Dr. William Darlington, West Chester, Pennsylvania, two letters dated May 31/June 12/1841, and 12/24/1841, respectively.
   The Boston Society of Natural History, dated May 31/June 12/1841.
   The Massachusetts Horticultural Society, dated May 31/June 12/1841.

2. Seed samples to
   Dr. Torrey, 265 packets
   Dr. Darlington, 250 packets
   Massachusetts Horticultural Society, 258 packets
   All accompanied by the seed list "Index Septimus Seminum . . . . 1841."

3. Pamphlets (mostly addressed to the Boston Society . . .)
   1. Enumeratio Plantarum quas in itinere per Provinciam Talysch, collegit R. Fr. Hohenacker. (178 pp.)
   2. Enumeratio Animalium quae in provinciis Transcaucacis, Karabach, Schirwan et Talysch nec non in Territorio Elisabethopolensi observavit R. Fr. Hohenacker. (pp. 136-147)
   3. Lettre sur les genres Xanthenum et Chardinia adressé au Director de la Societe' G. Fischer de Waldheim, par F.E.L. Fischer et C.A. Meyer.
   4. Tabula Botanico geographica Tractus Suwant.
   5. Extrait de Nouv Mémoires de la Societé Impèriale des Naturalistes de Moscou. Tome IV. 1836 (19 pp.)
   6. Réglement de la Societé Russe D'horticulture. Moscou, Imprimerie de l'Universite' Imperiale'. 1837.
   7. Lepidoptera duo nova Rossiae Meridionalis icone et descriptione, illustrata a G. Fischer de Waldheim (Séance de Janvier 1839). (pp. 1-4, tab. IV).
   8. Ueber ein der St.-Wladimir-Universität zu Kijew gehörendes bisher unbekanntes Manuscript; von v. Koeppen (lu le 23 août 1839). (pp. 1-7 + Plate of Batta manuscript).
   9. Index Seminum, quae Hortus Botanicus Imperialis Petropolitanus pro mutua commutatione offert, Accedunt animadversiones botanicae nonnullae. Januario, 1835. (pp. 1-42)
   10. Animadversiones botanicae. Decembri, 1835. (pp. 1-29)
   11. Animadversiones botanicae. Martii, 1837. (pp. 1-19)
   12. Animadversiones botanicae. Decembri, 1837. (pp. 31-57)
   13. Animadversiones botanicae. Decembri, 1838. (pp. 33-43)
   14. Animadversiones botanicae. Decembri, 1839. (pp. 1-25)
   15. Animadversiones botanicae. Decembri, 1840. (pp. 41-59)
   16. Index Septimus Seminum, quae Hortus Botanicus Imperialis Petropolitanus pro muta commutatione offert, Accedunt animadversiones botanicae nonnullae. Decembri, 1841.

Seed packets sent to William Darlington. Photo by Gary Koller.

Among the seed samples sent to the different correspondents by Fischer are 265 packets to Dr. John Torrey, 250 to Dr. William Darlington and 258 to the Massachusetts Horticultural Society. They are all very small packets, most of them numbered and some hand labeled. The packet numbers correspond to the numbers on the seed list of the St. Petersburg Botanic Garden of the year 1841. This seed list is entitled "*Index Septimus Seminum, quae Hortus Botanicus Imperialis Petropolitanus pro muta commutatione offert, Accedunt animadversiones botanicae nonnullae*" (a rough translation of which is "Seed List Number Seven, Offered by the Imperial Botanical Garden, St. Petersburg, for exchange, together with some Botanical Observations"). The list is item nine on the list of pamphlets given above. A copy of "*Index Septimus Seminum . . .*" was included in each of the seed packages sent to the correspondents.

The seed list included in the packages is Number 7 of a series of such lists published by the St. Petersburg Imperial Botanical Garden. It contains 59 pages and lists 2952 items of seeds. Toward the end of the compilation is a section entitled "*Animadversiones botanicae*" ("Botanical Observations"). The section contains botanical and nomenclatural notes on certain plants and includes descriptions of new species. The practice of publishing descriptions of new species in the seed lists of botanical gardens was general at that time, a practice which makes these seed lists publications of permanent scientific value. The seed lists were apparently not widely circulated and may not be represented in many botanical libraries. British botanist W.J. Hooker, in the year 1836 (Hooker, 1836), published a note calling the attention of botanists to this relatively unknown publication when the first number of the St. Petersburg seed list series appeared in 1835.

In this, Seed List Number 7, the description of new species includes one *Eucharidium grandiflorum* Fischer and Meyer, a California species discovered at the Russian colony of Fort Ross (No. 1041 on the seed list). A member of the Onagraceae family, this new genus from California was established earlier by Fischer and Meyer in the same seed list series, Number 2, in 1835, with the type species, *E. concinnum*, *E. grandiflorum* was the second known species of the genus. Later (in 1864-65) Asa Gray added a third species, *E. breweri.*

The "*Animadversiones botanicae*" sections of subsequent numbers of the "*Index Seminum*" series of the St. Petersburg Botanical Garden are in the inventory given above (items 10 through 15). These six sections contain descriptions of other newly found species from various parts of the world, many from California.

The California explorations of the Russians in the years before 1841 were of special interest to American botany. Many new American species were discovered, the types being preserved in Russia and the descriptions first published in the St. Petersburg Imperial Botanical Garden seed list series.

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FLORA OF TAIWAN

This is the first time an illustrated FLORA OF TAIWAN has been presented for all native vascular plants. It contains 4,300 pages, with 1,713 drawings and 12 full-color photographs. It will have great reference value not only to botanists but also to teachers, students, pharmacists, agronomists, gardeners and the natural products industry. Libraries and institutions of higher learning all over the world will find this set indispensable.

FLORA OF TAIWAN is the result of a cooperative research jointly sponsored by the National Science Council of the Republic of China and the National Science Foundation of the United States. It was edited by the editorial committee consisting of: Dr. Hui-Lin Li, Morris Arboretum; Dr. Tang-shui Liu, Forestry Department, National Taiwan University; Dr. Tseng-chieng Huang, Botany Department, N.T.U.; Dr. Tetsuo Koyama, The New York Botanical Gardens; Dr. Charles E. DeVol, Botany Department, N.T.U.

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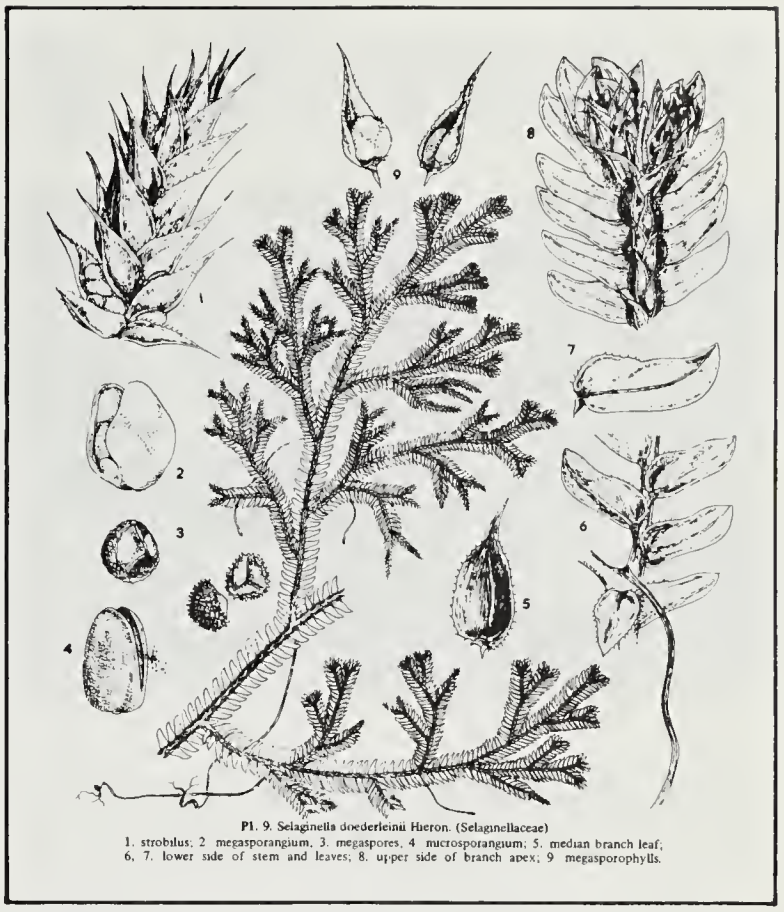
Publication dates for each of the six volumes are scheduled as follows: Vol. 1, Summer 1975 (available now); Vol. 2, Autumn 1975; Vol. 3, Winter 1975; Vol. 4, Spring 1976; Vol. 5, Summer 1976; Vol. 6, Autumn 1976.



Pl. 9. Selaginella doederleinii Hieron. (Selaginellaceae)
1. strobilus; 2. megasporangium, 3. megaspores, 4. microsporangium; 5. median branch leaf; 6, 7. lower side of stem and leaves; 8. upper side of branch apex; 9. megasporophylls.

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shrub profiles

Koller

Autumn Sparkle from Winterberry

by Gary Koller

Autumn is the season of brilliance for winterberry holly (*Ilex verticillata*). In October the green leaves take on a reddish blush and the clusters of pea-sized fruits ripen to a bright red creating a color composition of subtle beauty. After first frost the leaves turn black or brown giving rise to a second common name of black alder. The leaves fall quickly and all that remains are shining berries which bedeck the smooth gray branches. During misty periods the red of the fruit is reflected from particles of moisture giving the plant and its surroundings a bright red glow.

The berries which occur in clusters remain in good condition through the Holidays and are excellent in Christmas arrangements. They can be used fresh or air dried and will last over an extended period. The specific name of this holly is *verticillata*, meaning "in circles around the stem," and alludes to the growth characteristics of the berries.

Winterberry grows under moist soil conditions. This feature may be a greater asset to people having heavy, poorly drained soils than are the decorative berries. The plant not only tolerates but thrives in wet soils. In fact, the plant occurs naturally in low areas in a range extending from Canada to Florida and west to Wisconsin and Missouri. High, dry soils are equally adaptable, but growth will be slower.

A third asset is the plant's ability to grow and bear fruit in shady locations. In full sun the plant grows dense and compact, but in shade opens up and eventually resembles a small tree. It makes a good understory plant and easily adapts to naturalized planting schemes.

Typically, multiple spreading stems produce a mound-shaped specimen. Without pruning, in full sun, and with time the plant will reach ten feet high and spread six to eight feet. In shaded locations and trained to one or two stems the plant can reach a twenty foot height. The holly's growth is generally slow which necessitates only occasional pruning to maintain a specific size. The plant has little trouble from insects and disease, and it is not a temperamental grower.

The deciduous leaf, which grows 1½" to 3" long, is simple, alternate, and varies in shape from obovate to lanceolate. The leaves are serrate or double serrate and usually pubescent beneath.

Flowers bear five to eight petals which are small and inconspicuous. Sexes are separate and, as a result, two plants are needed for pollination and fruit production. One simple method to achieve pollination is to purchase a plant of each sex. The two are set in the same hole with the female facing the prime viewing direction. As they develope the male can be pruned to maintain a low profile but look a part of one larger shrub. Other solutions are to tuck the male at the back of a shrub mass or give a neighbor the male plant as a gift.

Landscape uses are many; as a specimen plant, mixed in a shrub border, used as an informal hedge, or as an espalier where the wall highlights the autumn berries. One very showy combination is with Yellow Twig Dogwood (*Cornus sericea* cv. 'Flaviramea'). From late October through December the yellow stems of the Dogwood are very striking in combination with the red berries and brighten an otherwise bleak landscape.

The plant shows much variability when grown from seed and, as a result, several selections are being grown. 'Chrysocarpa' has yellow fruit; 'Nana' is a female clone with large fruits and a mature height of 3½ feet; 'Christmas Cheer' is selected for abundance and keeping qualities of the fruit; cv. 'Sparkleberry', a hybrid developed in a breeding program at the National Arboretum, but not yet available, was selected for its abundance of bright pink berries. Several selections may be purchased by mail order from the following suppliers:

Gardens of the Blue Ridge
Ashford, McDowell County
North Carolina 28603

Carroll Gardens
Westminster, Md. 21157

Specimens of this holly are scattered around the Arboretum. One of the finest females is located above the road northeast of the Heath Garden. Why not come for a winter walk and see the winterberry holly first hand?

Native Azaleas at the Morris Arboretum

J. J. Willaman

In 1951 Dr. Henry T. Skinner made an exhaustive survey of the native azaleas of the eastern, southeastern and gulf states. He recorded 14 species, 5 varieties and 13 natural hybrids. He collected 8000 herbarium specimens which are on file at the Arboretum. He also collected 500 live specimens, covering all the above taxa, and sent them back to the Arboretum for planting. On receipt, some were placed in a deep coldframe, and some were potted and held in a greenhouse. The following spring, 1952, after some culling, 221 were planted in the Arboretum grounds.

In 1955 a survey of the plantings revealed that during those first three years 13% of the plants had died. There is no record as to a possible cause of the deaths. No further observations were made until the present study in 1975, by which time another 71% had died, including all the specimens of ten of the above taxa. Thus the present survey found only 22 of the original 32 taxa, and a total of 36 specimens.

Besides the above living plants of the Skinner collection there are on the Arboretum grounds six of these native azalea species propagated from commercial seed in 1950, and another six obtained from cuttings in 1953 from the original collected plants. A fourth group of 14 taxa of uncertain or unknown origin are on the grounds, although most of these probably were from the Skinner collection and some from seed. Thus these four groups taken together comprise the azaleas native to the region given above which are now at the Arboretum. The table gives the significant data on the plants in these four groups.

Perhaps the most noticeable feature in the table is the high mortality. That of the 1951 collection is mentioned above. Also, of the 47 cuttings propagated in 1953 only 20% remained in 1975. No obvious causes such as diseases or mice have been noted, but some speculations may be in order.

In the original collections the vicissitudes of digging, shipping, holding over winter and planting must have been considerable. Then the survivors may have been subjected to a soil pH higher than optimal. Wherry (5) points out that the soil in the area of the first plantings at the Arboretum is "moderately acid." Wyman (6) writes that for azaleas "The soil, of course, must be acid, of a pH between 4.5 and 6.5". Bush-Brown (1) says "A pH range of 4.5-5.5 is considered optimal for most types (of azaleas)." Skinner (3) writes, ". . . also in South Carolina it was discovered that the inland red clay hills of the Piedmont . . . support very few azaleas. These hills grow excellent cedar and have a soil pH often in the vicinity of 7.0, which is doubtless the explanation." Skinner makes other statements of similar import.

With the thought that some of the mortality in the original collections may have been due to bringing the plants from warmer to cooler surroundings a comparison was made. In the following, the hardiness zone of collection, the percentage in that zone of the total dead, the percentage in that zone of the total living are: zone V, 5, 0; VI, 12, 3; VII, 38, 31; VIII, 30, 35; IX, 15, 29. Since there is some tendency for the proportion of live to dead to increase as we go from V to IX, this may be a minor factor in the mortality of the collected plants.

A related item concerns *R. calendulaceum*. Twenty six were planted and none are living, although 10 of them had origins in colder zones (V and VI) than the zone VII of the Arboretum. It would seem that hardiness is not a question here. Of the ten taxa having no

Native Azaleas (*Rhododendron* spp.) at the Morris Arboretum, 1975

	No. of Specimens*	Height in Feet			Date of Blooming month/day	Seed Capsule Formed***
		Range in Arboretum Plants	Ave.	Range in the Record**		
Colleeted by H.T. Skinner in 1951, planted in 1952						
R. arborescens (Sweet azalea)	5/7	5-10	8	6-19	-	5/5
R. arborescens x *viscosum*	2/8	7-9	8	-	-	2/2
R. atlanticum (Coast azalea)	4/10	2-5	4	2-3	-	4/4
R. austrinum (Florida azalea)	1/4	-	10	10	5/20	0/1
R. bakeri (Cumberland azalea)	2/20	3-4	4	2-15	6/2	1/1
R. canescens (Hoary azalea)	11/27	4-12	8	13-15	5/20	3/11
R. nudiflorum (Pinksterbloom)	3/12	2-4	3	3-10	5/20	0/3
R. nudiflorum x *roseum*	1/2	-	6	-	5/20	0/1
R. prunifolium (Georgia late red azalea)	3/8	6-9	8	8-12	8/7	-
R. serrulatum georgiana	1/1	-	10	-	-	-
R. speciosum (Oconee azalea)	3/5	7-12	10	2-6	5/20	0/2
R. viscosum (Swamp azalea)	3/23	2-8	5	2-6	-	1/3
Grown from Commereial Seed in 1950						
R. alabamense	3	6-10	8	3	5/20	0/3
R. austrinum	8	3-12	9	10	5/22	0/5
R. canescens	4	5-10	8	13-15	-	0/4
R. oblongifolium (Texas azalea)	3	6-9	8	-	8/12	0/1
R. prunifolium	19	6-11	9	8-12	8/5-8/12	12/12
R. roseum (Roseshell azalea)	1	-	4	-	5/15	0/1
Grown from Cuttings in 1953						
R. arborescens x *viscosum*	1/2	-	7	-	-	1/2
R. austrinum	2/4	11-11	11	10	-	0/1
R. canescens	1/3	-	10	13-15	-	-
R. serrulatum (Hammocksweet azalea)	2/2	3-6	5	-	-	0/2
R. viscosum	2/2	6-7	7	2-6	-	2/2
R. viscosum aemulans	1/1	-	7	-	-	1/1
Plants of uncertain origin						
R. alabamense	1	-	7	3	5/20	1/1
R. alabamense x *canescens*	11	4-10	6	-	5/17-5/22	1/6
R. austrinum	1	7	7	10	5/16	-
R. austrinum x *canescens*	2	8-11	10	-	5/20	-
R. calendulaceum (Flame azalea)	1	-	4	2-16	-	0/1
R. canescens	7	3-8	5	13-15	5/17-5/28	5/5
R. bakeri	21	3-6	4	2-15	6/3-6/9	1/16
R. nudiflorum	3	5	5	3-10	5/17	0/3
R. roseum	1	-	6	9	-	1/1
R. viscosum	3	3	3	2-16	5/17	1/3
R. viscosum aemulans	1	-	7	-	-	1/1

* The denominator is the number of specimens planted in 1952, the numerator the number living in 1975.

** See refs. 2, 3, 4, 6.

*** The denominator is the number of living specimens in 1975, the numerator is the number of these specimens bearing seed capsules.

Rhododendron canescens **Photo by Gary Koller.**

survivors the specimens came from: *R. arborescens richardsonii* VII (1); *R. viscosum montanum* VII (3); *R. viscosum tomentosum* VIII (1); *R. alabamense* x *austrinum* x *canescens* VIII (1); *R. arborescens* x *bakeri* VI (1), VII (1); *R. arborescens* x *calendulaceum* x *viscosum* VII (6); *R. atlanticum* x *canescens* VIII (3); *R. atlanticum* x *nudiflorum* VII (1); *R. calendulaceum* x *nudiflora* VI (3); *R. calendulaceum* x *roseum* VII (6). Only small numbers are involved here, but very little change of zone was present and it could hardly be a factor in the mortality.

Furthermore, species from the moist mountainous habitats might find it difficult to adapt to low coastal and sometimes dry conditions in the Philadelphia area without special cultural help.

Natural hybridization occurs frequently in these azaleas. In the present material 13 different hybrids were collected, with a total of 56 plants. Five hybrids, 13 plants, have survived and are doing well. Of the 14 species no hybrids of four of them were found – *R. oblongifolium*, *R. prunifolium*, *R. serrulatum*, *R. speciosum*. This could have been because they did not grow near other species and bloom at the same time. There is some evidence that the hybrids of the Arboretum collection have had a somewhat higher mortality rate than have the species and varieties. By 1953 and 1975 the hybrids had 20% and 70% mortality, respectively, out of 57 plants while the species and varieties had 12% and 62% out of 164.

Skinner writes: "The azaleas of Gregory Bald [in Great Smoky Mountains National Park] are at first glance bewildering and almost unbelievable . . . It is the marginal region between trees and grass sod which supports a peripheral band of a bizzarre collection of azaleas – thousands of plants in every imaginable hue from pure white to pale yellow, salmon yellow, clear pink and orange-red to red. Many of the flowers are yellow blotched, many of the bushes are stoloniferous and foliage varies from normal to deep glossy green, often glaucous beneath. Obviously it is a complicated hybrid swarm dating, in some of the older plants, to perhaps thirty years ago." He established three probable parents: *R. calendulaceum* (later identified as *R. bakeri*), *R. arborescens* and *R. viscosum*. In a personal communication he wrote, "Such hybrids seem relatively transient or ephemeral in the wild and from the above observations may not be as durable as the species under cultivation."

From the above data a rough, subjective evaluation of the group for cultural adaptability in the Philadelphia area would be: **good** for *R. alabamense*, *R. alabamense* x *austrinum*, *R. alabamense* x *canescens*, *R. atlanticum*, *R. prunifolium* and *R. viscosum*; **medium** for *R. arborescens*, *R. canescens* and *R. nudiflorum*; and **relatively poor** or **tricky** for *R. bakeri*, *R. calendulaceum* and *R. roseum*.

Our grateful thanks go to Dr. H.T. Skinner and to Dr. H.-L. Li for invaluable suggestions during this survey.

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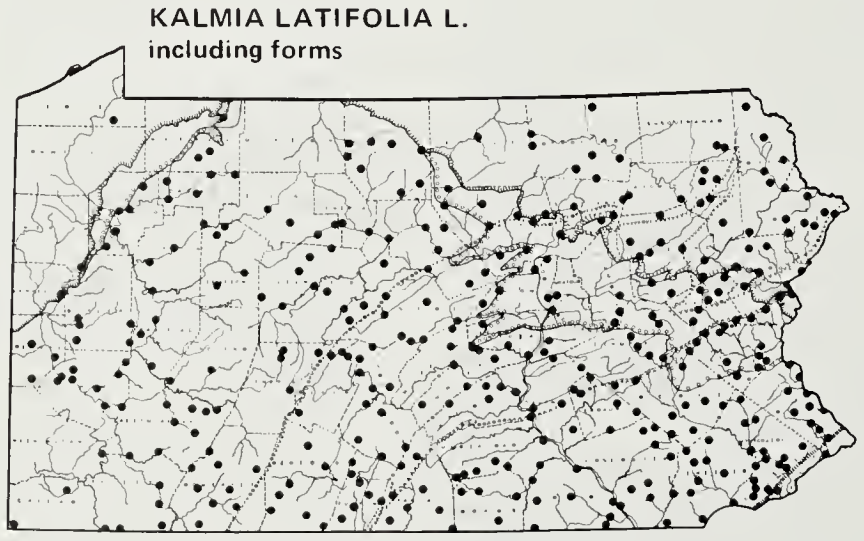
ATLAS OF THE FLORA

The *Atlas of the Flora of Pennsylvania*, forty years in preparation, is scheduled for publication by the Morris Arboretum in the spring of 1976. This prodigious work will be welcomed by botanists, ecologists, foresters, conservationists, environmental and regional planners, naturalists, horticulturists, and other plant scientists, students and a host of dedicated amateurs.

The *Atlas* shows on dot maps the known distribution, up to year 1970, of more than three thousand native and introduced plants in Pennsylvania. Each is confirmed by specimens in the five major herbaria of the state. The locations were plotted originally on 8 x 13½" base maps with 1/8" diameter dots. The center of the dot was usually accurate within 1/10 mile of the collection point. Special care was taken to pin-point locations precisely in relation to physiographical features such as the Fall Line or terminal moraine. In total, there are 2,940 maps. Most represent an individual taxon, but a few also include one of limited occurence or of minor importance.

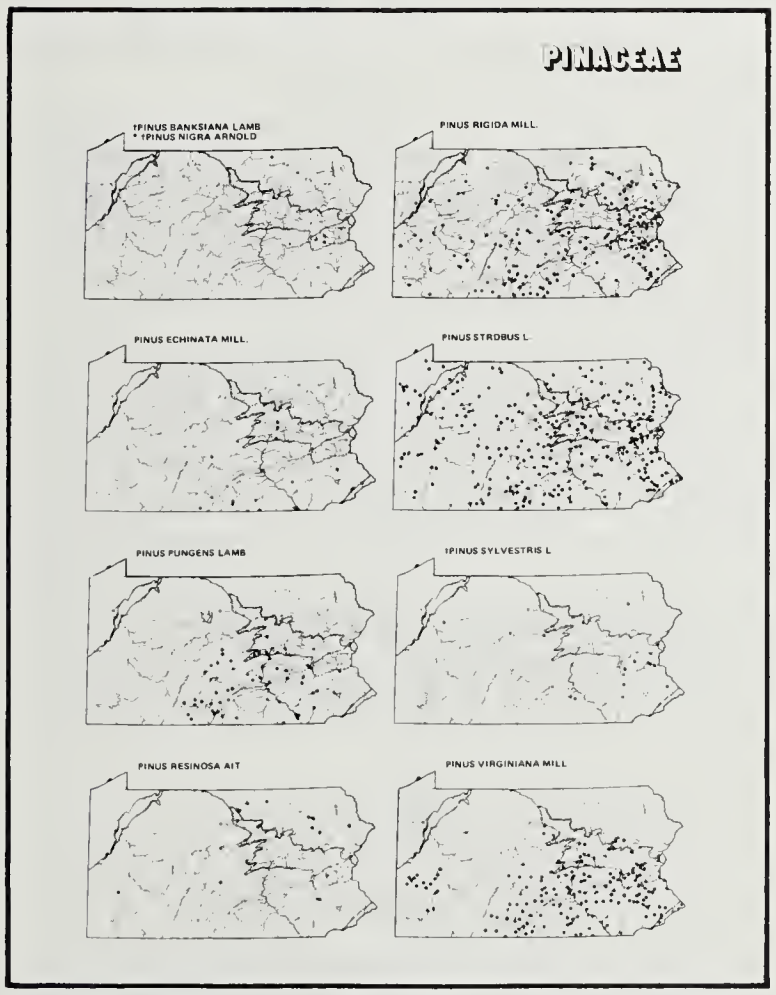
The base maps show the county outlines and important physical features which influence the occurence of many species such as, major streams and significant geological boundaries, the coastal plain, piedmont, ridge-valley, and Appalachian plateau. The *Atlas* contains a brief discussion of the geology of Pennsylvania and its relationship to plant distribution. While many taxa range widely over surrounding states, a considerable number reach a geographic limit in Pennsylvania or extend only sparingly beyond its borders. The *Atlas* separates these taxa into four geographic associations; Northern, Midland, Appalachian and Lowland. Endemic species are also listed.



Actual size of maps appearing in the *Atlas*

The distribution maps are grouped in families in essentially the Engler-Prantl sequence of systematic arrangment. However, genera, species and varieties are grouped alphabetically so as to be found more readily. The family names are shown on the top of each page and in the place of a map along with its common name, as each new family occurs. The family names are also listed alphabetically for easy reference. Common names for genera and species are not used. Introduced taxa are indicated by a "dagger" symbol. The individual maps are reduced to about 2 x 3¼" and arranged eight to the page. The dot locations have good legibility. A full size base map is included for reference. The trimmed page size of the *Atlas* is 8½ x 11" and is printed on very high quality, acid free white paper, with a durable case binding and hard back cloth cover. The attractive dust jacket and cover with original art work by Susan Blum, featuring the Pennsylvania State Flower, *Kalmia latifolia*, is

OF PENNSYLVANIA



Page of the *Atlas of the Flora of Pennsylvania*, one-third actual size.

printed in pink and green on white. The *Flora of Pennsylvania* project was started in 1935 under the direction of Professor Jacob R. Schramm, Chairman of the Department of Botany at the University of Pennsylvania. Dr. John M. Fogg, Jr., Emeritus Professor of Botany, University of Pennsylvania, devoted much time to this project in its early years, working with countless students and volunteers in the field, the herbarium and the office. He, along with the late Dr. Herbert A. Wahl, Emeritus Professor of Botany, the Pennsylvania State University, established the correct identification of most of the specimens. They also prepared keys for many groups which will someday form the basis of a descriptive flora of Pennsylvania. Dr. Edgar T. Wherry has been involved in the later stages of the project for many years, even after retirement as Professor of Botany at the University of Pennsylvania. He prepared this final manuscript and the map headings for the *Atlas*. It is remarkable that Dr. Wherry, in his ninetieth year, is able to devote the skill and attention to such demanding and painstaking work.

In general, nomenclature follows *Gray's Manual of Botany*, Eighth Edition. Synonyms as used in the *Atlas* are listed opposite those published in Gray. Taxa missing in Gray's *Manual* are so indicated. Since Dr. Wherry has assumed responsibility for the preparation of the final manuscript of The *Atlas of the Flora of Pennsylvania*, he, as senior author, assumes responsibility for the nomenclature used.

Dr. Carl T. Keener, Associate Professor of Botany at Pennsylvania State University, has reviewed the text on behalf of the late Dr. Wahl and has made many useful suggestions regarding typography and nomenclature, and prepared the index. This writer has served as editorial coordinator. The book and jacket design is by the University of Pennsylvania Printing Services, printing and binding by Allen, Lane and Scott of Philadelphia.

The *Atlas of the Flora of Pennsylvania* is being offered at a pre-publication price of $40.00 per copy, postpaid, for all orders received by May 31, 1976. The list price for the *Atlas* will be $45.00 beginning June 1, 1976. Quantity discounts to *bona fide* resellers are available on request.

Gordon A. Brandes

ANNOUNCEMENT

of Importance to
MORRIS ARBORETUM BULLETIN
Readers and Subscribers

The Advisory Board of Managers of the Morris Arboretum at its meeting June 11, 1975, voted to discontinue publication of the *Morris Arboretum Bulletin* in its present quarterly format at the conclusion of the current volume, Number 26, 1975. High costs of publication and a divergence of interests among members and readership are cited as the compelling reasons for this action. The Arboretum will, however, publish eight to ten issues annually of its newsletter WoodChips which will include more horticultural and botanical information of interest to the members. In all likelihood, the quarterly *Bulletin* will be replaced with an annual *Bulletin* which will be offered in exchange for similar publications with other institutions. Subscriptions and renewals to the annual *Bulletin* will be offered at $4.00 in 1976. The newsletter WoodChips will also be offered in exchange for newsletters or will be available by subscription at $5.00 annually.

GORDON A. BRANDES,
Managing Director

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books

500 PLANTS OF SOUTH FLORIDA by Julia F. Morton. E. A. Seemann Publishing Company, Inc. Miami, Florida, 1974. $9.95.

500 Plants of South Florida presents the woody and herbaceous plants of the Miami and St. Petersburg area south through sub-tropical climes to the tropical zones of the Florida Keys. Here are 500 native and introduced plants arranged to give the layman "the essential facts on as many as possible of the popular and interesting plants" of the region.

Julia F. Morton is a widely-known botanical researcher and author, and she has brought her broad knowledge to a concise format. Each of the 500 plants is described in a single paragraph; listing is alphabetical by genus; a partial list of common names opens the paragraph. Each plant description is a "'word picture' to aid the layman in recognition and confirmation." Uses are noted – edibility and medical applications as well as notation of poisonous parts. Horticultural notes include growth rates, methods of propagation, light requirements, ornamental value and undesirable features, if any. A goodly number of the 500 plants are illustrated, most with high quality black and white photographs but there are also 20 pages of color reproductions.

The imagination of the winter-weary Northerner

THE FERN GUIDE

NORTHEASTERN AND MIDLAND UNITED STATES AND ADJACENT CANADA

By Edgar T. Wherry

The Morris Arboretum of the University of Pennsylvania, 1972.

Copies available through the Morris Arboretum
9414 Meadowbrook Ave., Phila., Pa. 19118.
$3.00 postpaid

is tickled to see so many common houseplants recommended for landscape uses: wandering jew and asparagus fern are recommended as ground cover; crotons are listed as shrubs to 12 feet. *500 Plants of South Florida* would make an excellent gift for the friend or relative retiring to the Florida area. Or it could answer the many questions of the plant-curious winter traveler.

Susan B. Blum

THE EDIBLE ORNAMENTAL GARDEN, John E. Bryan & Coralie Castle, 101 Productions, San Francisco, California, 1974. $4.95.

The Edible Ornamental Garden is an intriguing book for the gardener who likes to cook and who wants some conversation pieces in the perennial border. The authors suggest combining the commonly known, less decorative edible plants with the ornamental flowers, bushes and trees little known today for their culinary applications. The book deals with cultivated plants and their historical culinary uses, not those of the wilderness that are now receiving much attention elsewhere. These are plants "that you can bring to your own garden where you like to work, relax and entertain".

John Bryan, Director of Strybing Arboretum, San Francisco, a horticulturist trained in Edinburgh and Wisley, provides the historical and cultural information. Mrs. Castle, author of several cook books, contributed the recipes, many of which she developed from her own very ornamental and highly edible garden.

How about some: Birch Shoot Salad, or Bean Salad with Gladiolus, Primrose Stuffed Squid, Lamb Roast with Douglas Fir Tips, Mashed Potatoes or Turnips with Calendula (marigold) Petals, Rose Petal Crepes with Pyracantha Jelly, and for dessert Mulberry Zabaglione and Fuchsia Cake?

The history, recipes and cultural directions are well done and not too wordy. Alas, the pest control recommendations are vague, superficial and even misleading. I still prefer quickly dissipated malathion to garlic/cayenne pepper spray on my edibles, ornamental or otherwise. Nevertheless, *The Edible Ornamental Garden* is an innovative book and good reading if, as I, you like to garden, cook and eat. Pick up a copy at the Arbor Shop or the Arboretum office.

Gordon A. Brandes

THE HANDMADE GREENHOUSE; FROM WINDOWSILL TO BACKYARD. by Richard Nicholls. Running Press, Philadelphia, Pa. 1975. $4.95.

The Handmade Greenhouse is an informative paperback written for the general purpose of enabling someone to build a simple greenhouse and grow plants in it. Mr. Nicholls begins by reviewing in depth the reasons for having a greenhouse, types of greenhouses, where to locate them, and how to prepare for their construction. One chapter also helps the reader decide whether he should build or buy his greenhouse.

Good advice to the prospective builder of anything more than a window box is to look elsewhere for more help. The designs the author presents are less than attractive, and mostly impractical. The plywood construction of the window boxes restricts light, and the stability of the rigid frames would be endangered by the collection of snow and water on the surface of the houses. In addition, all of the greenhouses are poorly ventilated. Nevertheless a perceptive mind may extract a few hints to help him build his own house. The author goes a long way in simplifying a seemingly complicated task, and with improvements in his designs, each might make an acceptable growing structure.

Ironically, though Nicholls's book falls short of becoming a complete greenhouse construction guide, it contains several well-organized chapters. Among them are some dealing with the care of greenhouses and greenhouse plants. Though discussions are necessarily brief, they are better because of it. Whenever quantities of information are condensed into a few pages, the resulting paragraphs exclude wordy sentences that waste the reader's time. And Nicholls's keen organizational ability makes his book easy to understand.

There is a section on insects, one on diseases, and a special emphasis on avoiding these problems. Another chapter deals with proper control of a greenhouse environment. At the end of the book is a section listing addresses of both manufacturers and sources of plans for building greenhouses.

Finally there are lists of several places where one can obtain indoor lights, fertilizers, pesticides and plants of various kinds.

In summary, the book is not a bible but an aid. If scrutinized, it can be used to the advantage of anyone who would buy, build or maintain his own plants in winter. *The Handmade Greenhouse* is available in many book stores in this area.

Gerald Olsyn

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ERRATA Volume 26

Page 4: Dr. Thomas Rorsfield to read Dr . Thomas Horsfield.

Page 23: Warren Baldisefen to read Warren Baldsiefen.

Page 47: *Gingko biloba 'Fastigiata'* to read *Gingko biloba* 'Fastigiata'.

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